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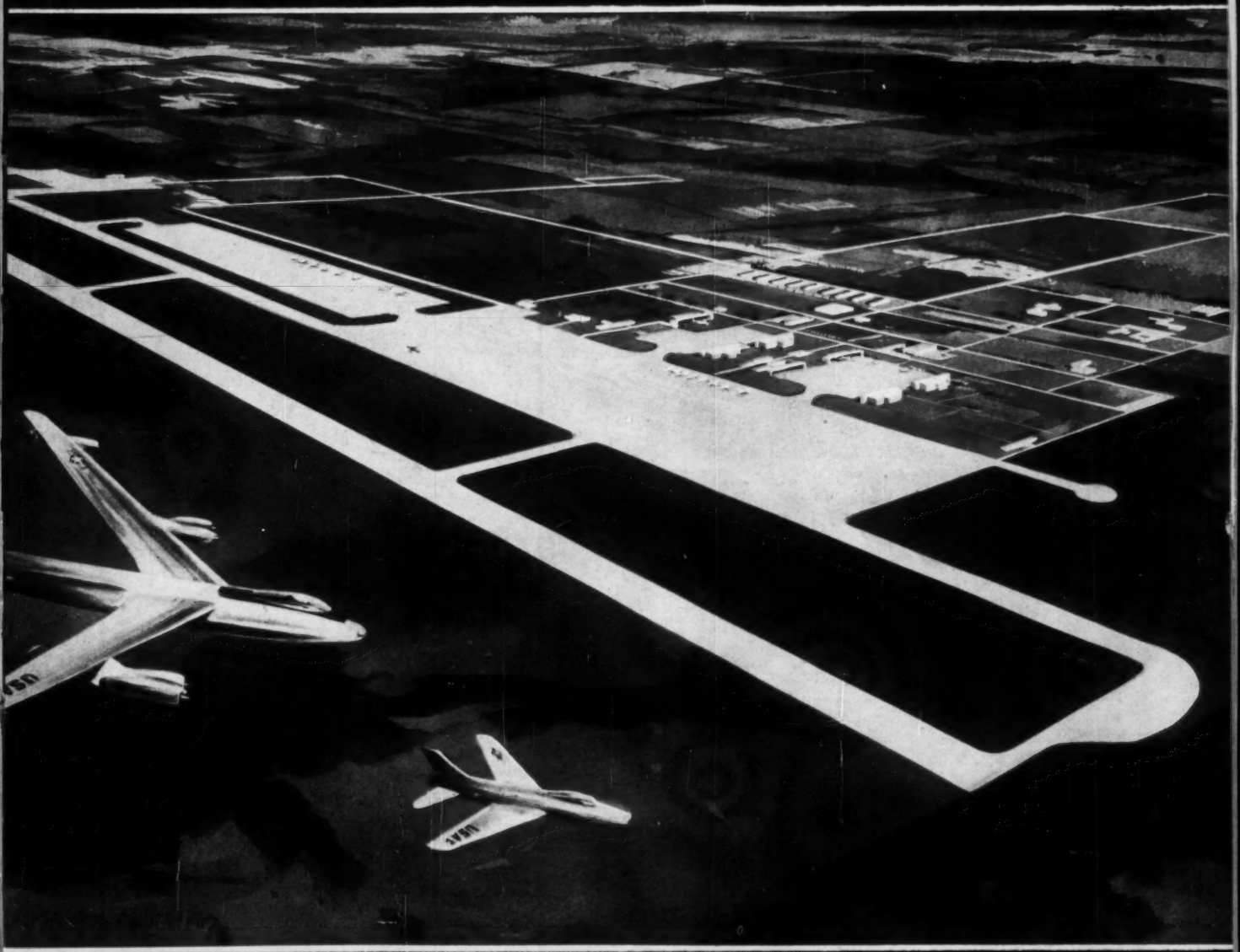

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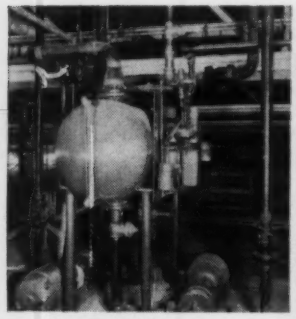
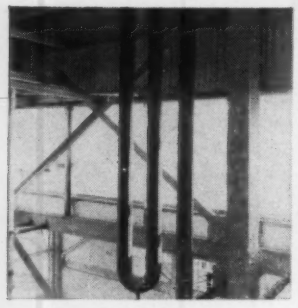
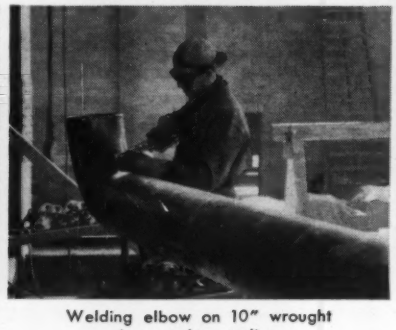


Wrought iron pipe serves condensate pump battery

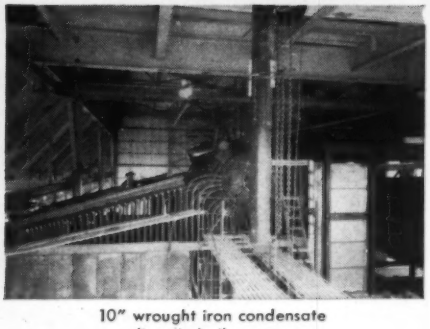


8" wrought iron condensate overflow line in boiler room

Wrought iron steam return on trestle between buildings



Welding elbow on 10" wrought iron condensate line



10" wrought iron condensate lines in boiler room

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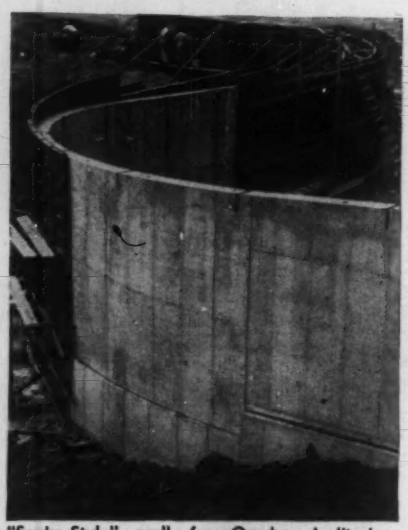

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Number of copies of this issue printed 67,714

CONTENTS ON PAGE 17

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Publisher

June 2, 1955 ENGINEERING NEWS-RECORD Vol. 154, No. 22

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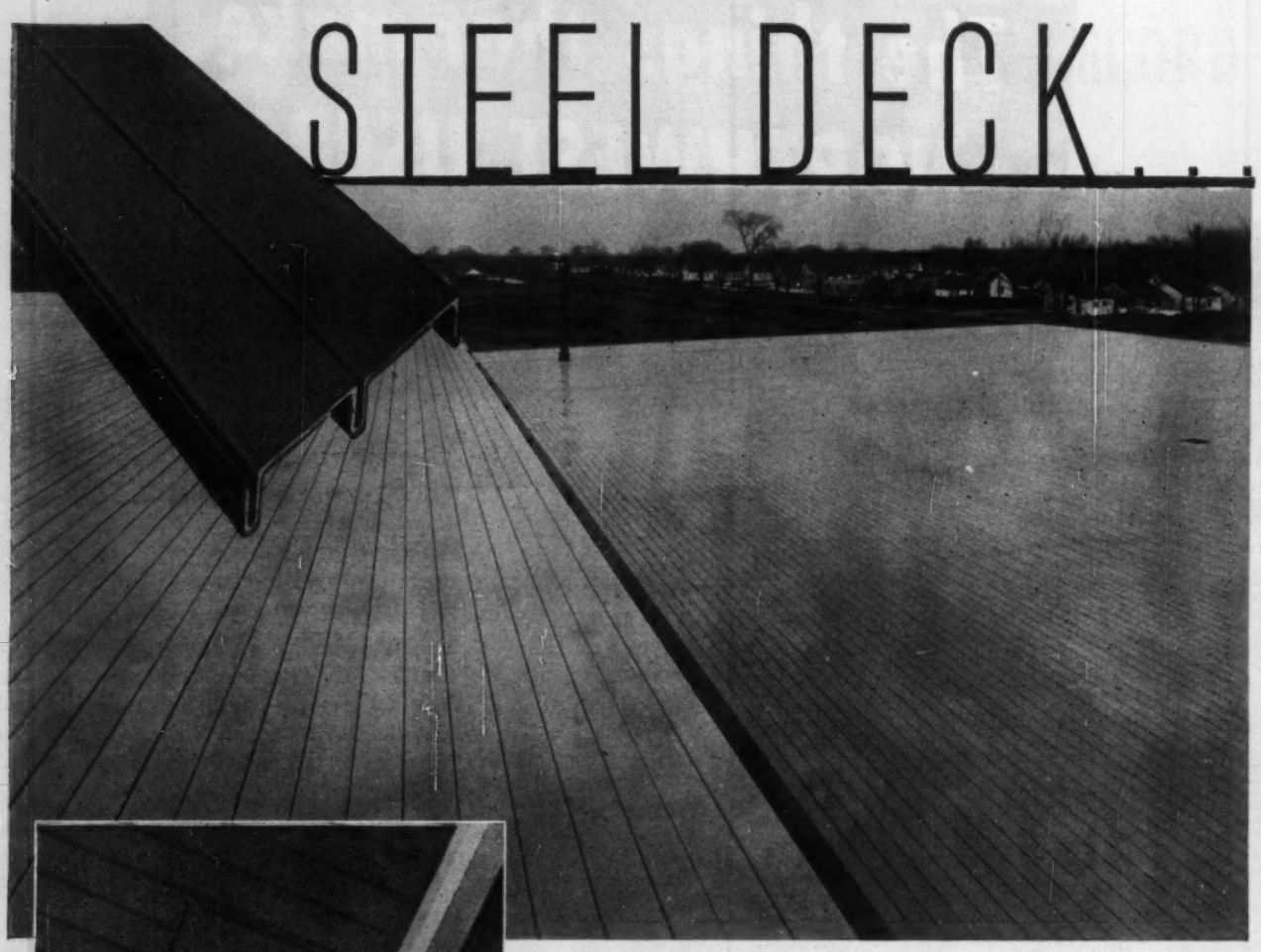

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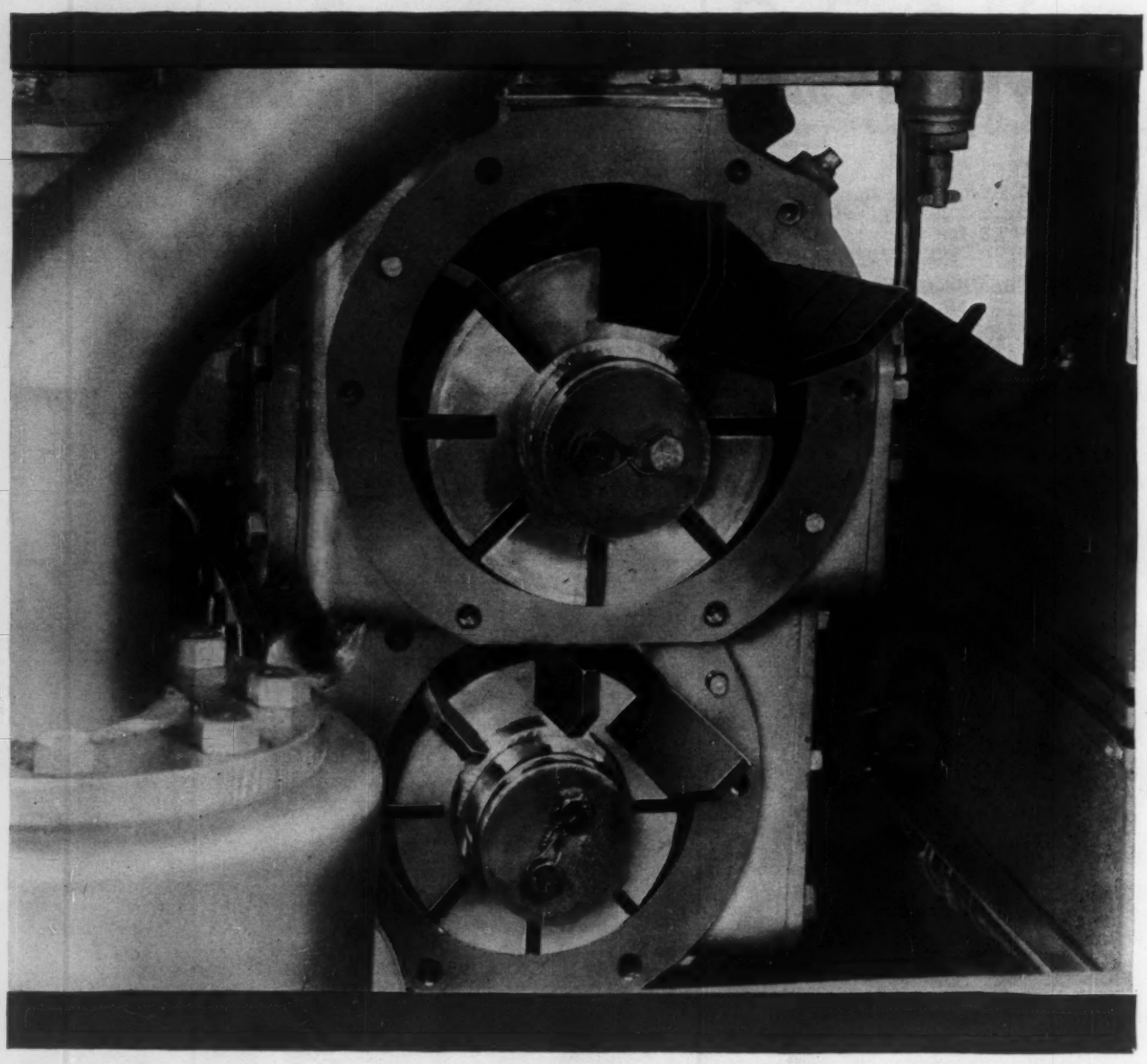

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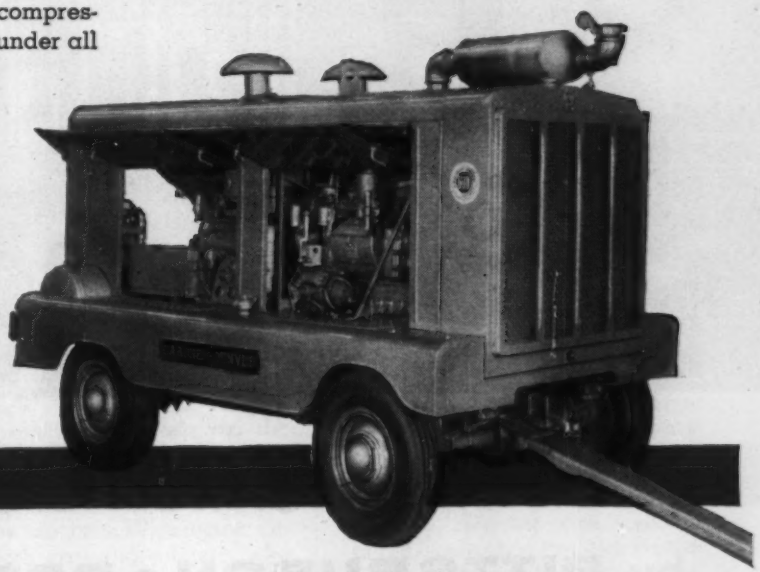

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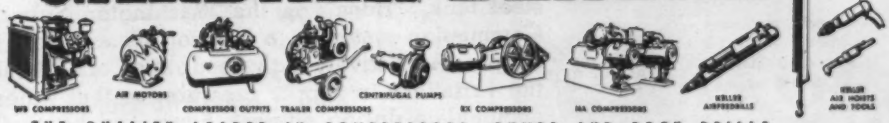

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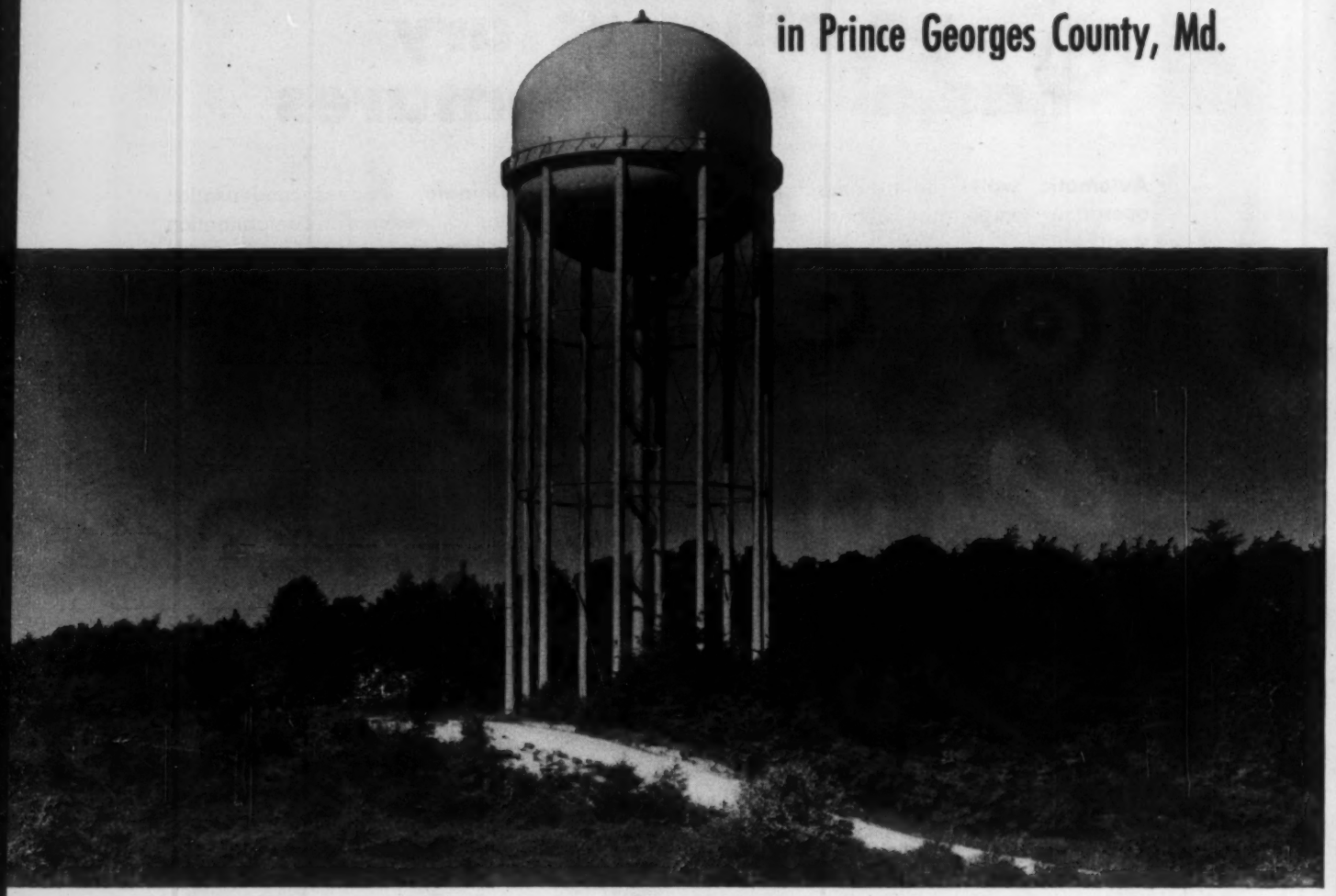

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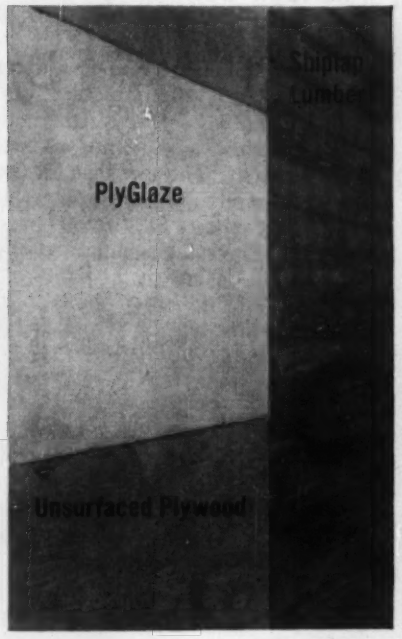

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READER COMMENT

Inter-American Highway

SIR: Your Central American correspondent writing from Boston in the May 14 issue of ENR, p. 10, refers to your editorial of 10 March regarding "An overrated Highway", but apparently has missed the point of your remarks as he brings up again the military value of a road which was abandoned by our military as of no value in giving access to Panama during the late war.

Having probably more acquaintance with the route in question than Mr. Borge, my half century of experience includes building the first section of the route adjacent to Panama City in 1906 and that through and near Managua, Nicaragua, some 20 years later as well as motor investigations from Mexico across Guatemala and El Salvador to Honduras and rail trips from Mexico to and across Guatemala, Nicaragua and Costa Rica.

In the Engineering Societies Library in New York are the volumes of maps and reports of surveys for a Pan American railway following the west coast through Central America to Peru. The railroad lines built in Guatemala and Nicaragua follow sections of this survey which continues along the coast of Costa Rica, a route which the subsequent highway plan should have followed instead of climbing to summits over 10,000 ft above sea level in a line through uncleared and uninhabited parts of Costa Rica. Apparently the surveys of this line and the maps and profiles made between 1890 and 1898 have been forgotten not only in Central American countries but also by our own Washington engineers, both civil and military, who had to learn the route again the hard way, and now their studies have been forgotten.

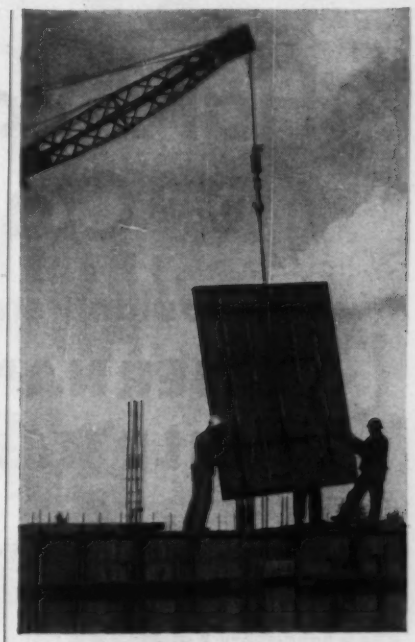
HENRY WELLES DURHAM
Sandwich, Mass.

More on Space-Frame

SIR: T. C. Kavanagh's comment (ENR April 28, p. 8) on the hidden-arch space frame (ENR March 24, p. 35) calls for further clarification of this structure on my part.

The hidden-arch space frame is not an application of the "basket handle arch principle" which was first introduced in bridge engineering and incorporated in the building of Rio Blanco River Bridge in Mexico by Mr. Kavanagh.

The space-frame structure resists



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READER COMMENT

and distributes the load in a different manner than the structure of the above mentioned bridge. Its reactions, internal stress and method of analysis are different. The fact that the arches have a common vertex forming a shape which resembles a "basket handle" has no structural significance and is incidental in the case of the space frame. The design of another structure of this type was recently completed by the writer where these vertices are spaced 52 ft apart horizontally.

The hidden-arch space frame is the application of a very old structure—the arch stiffened girder—to "hipped plate" roof construction. This arch-girder combination—in its statically determinate form—was very popular a few decades ago for small span bridges, especially so in European countries.

Mr. Kavanagh's comment and interest is very much appreciated by the writer.

ALEXANDER G. TARICS
John Lyon Reid & Partners
Architect-Engineer
San Francisco, Calif.

CALENDAR

Construction Industries Exposition and Home Show, Pan Pacific Auditorium, Los Angeles, Calif., June 9-19.

American Water Works Association, convention, Conrad Hilton Hotel, Chicago, June 12-17.

Sixth Hydraulics Conference of the Iowa Institute of Hydraulic Research, State University of Iowa, Iowa City, June 13-15.

American Society of Civil Engineers, Spring convention, Hotel Jefferson, St. Louis, June 14-17.

The American Institute of Architects, annual convention, Hotel Radisson, Minneapolis, Minn., June 20-24.

American Society for Engineering Education, annual meeting, Pennsylvania State University, State College, Pa., June 20-24.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-July 1.

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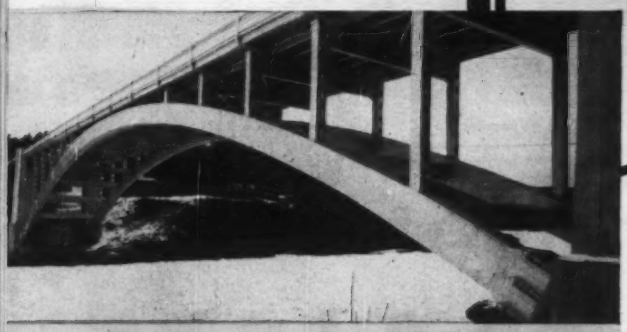
Construction with Safety,
Endurance and Economy

There is no substitute for STRUCTURAL STEEL in Bridge Construction

AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC. AISC FOUNDED 1921



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Typical of many Fort Pitt Bridges on the Pennsylvania Turnpike.

New bridge recently completed for Pennsylvania's new Penn-Lincoln Parkway.

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with faster erection and a better job—when you
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And there you are . . . 230 feet of boom! It's an all-time high for crawler cranes . . . 190′ of main boom with a 40′ jib. This machine is at work on a new apartment building in New York. It will pour concrete all the way to the top — 22 floors up. At the 15th floor level the crane is still able to reach the center section of floor, pouring direct without need for hoppers and concrete buggies. Think of the saving!

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It will pay you to get facts about P&H advantages. See your P&H dealer. P&H Power Crane and Shovel Division, HARNISCHFEGER Corporation, Milwaukee 46, Wis.

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

See your P&H dealer

"Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the kind of on-the-ground service that keeps your jobs moving on schedule. Your P&H Dealer is tops in the business. Get to know him."

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"We use Union's T5X motor oil exclusively in about 75 pieces of gasoline-powered equipment here on our Ramona Freeway job... 3.96 miles of 8-lane highway with 19 bridges and clover leafs, the largest single contract of this kind ever let in the state of California.

"Our oil and filter change interval is 2,000 miles for vehicles and 200 hours for stationary engines. Yet every time we drain a crankcase, we can't help noticing that the color and body of T5X looks as good as when we put it in. I can't quote any figures on how much T5X is extending our engine overhaul interval because in the past two years that we've been using T5X these engines have needed no appreciable amount of work for any reason whatsoever."

Like Mr. Brown of Peter Kiewit Sons' Co., maintenance men and master mechanics who've once tried T5X seldom permit any other oil to be used in the equipment which they service and maintain.

If you're not yet familiar with *amazing* purple T5X, we suggest you call your nearby Union Oil representative and place a sample order today.

J. D. Brown, master mechanic, Peter Kiewit Sons' Co.

B. A. Anderson, heavy duty mechanic, Peter Kiewit Sons' Co.

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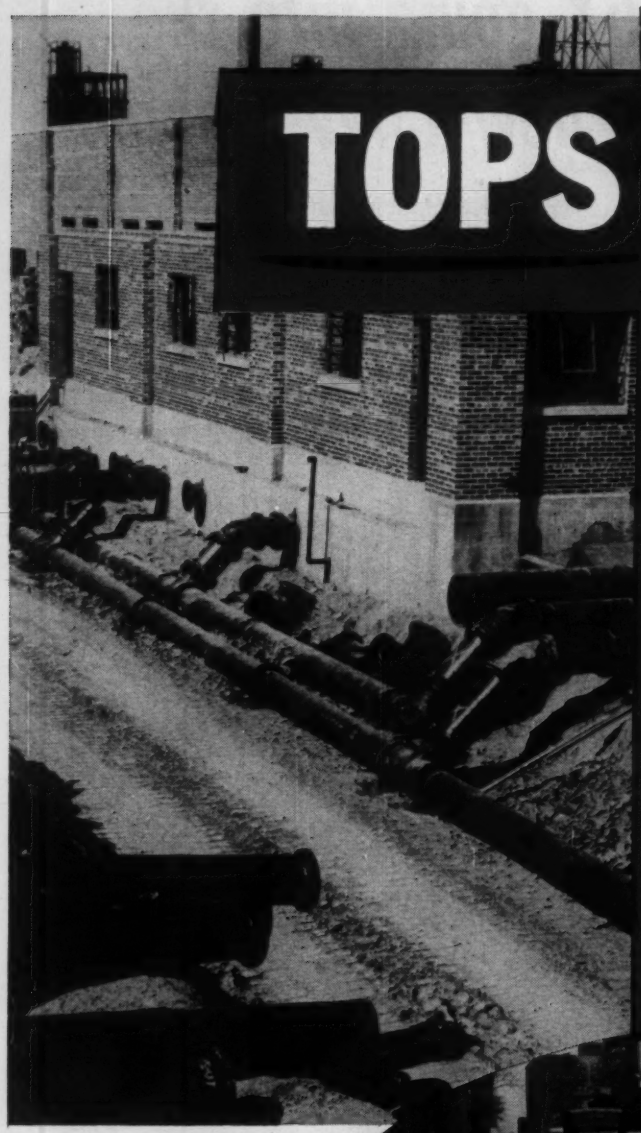
TOPS for strength,



For jobs, where long life is a *must*, you can specify cast iron pipe with confidence. Confidence in its strength and toughness—its ability to withstand beam-stresses, traffic shock, compressive loads—its proved long life over a history running into centuries. The factors which endow cast iron pipe with its great durability are also the factors which mean negligible repairs and maintenance costs. When the job calls for *permanence*, specify cast iron pipe. For further information, write Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Avenue, Chicago 3.

CAST Q IRON ®

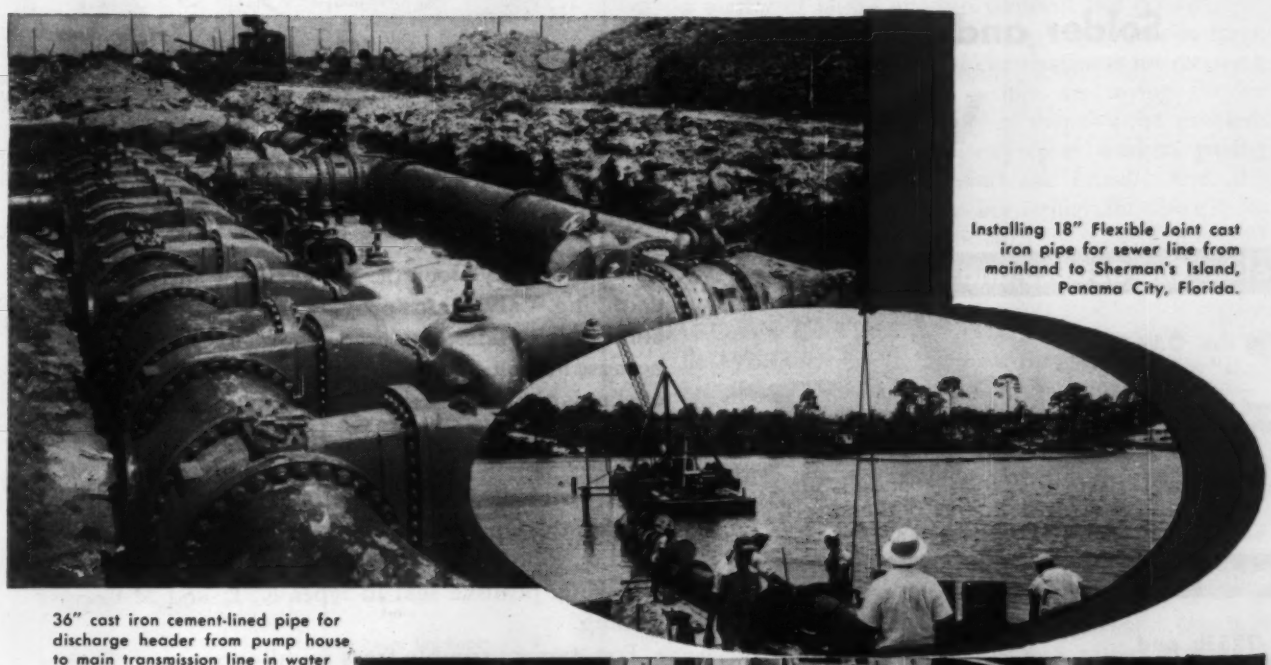
The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

Installing cast iron pipe for discharge lines from water circulating pump house to refinery units of oil refinery in middle west.

Mechanical joint cast iron pipe being installed for gas main in Milwaukee, Wis.

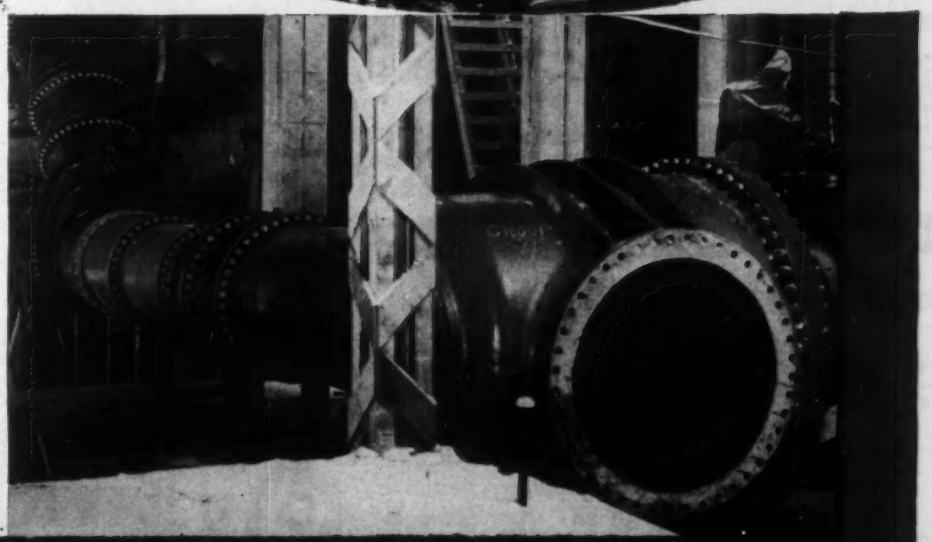
CAST IRON PIPE

toughness and long life



Installing 18" Flexible Joint cast iron pipe for sewer line from mainland to Sherman's Island, Panama City, Florida.

36" cast iron cement-lined pipe for discharge header from pump house to main transmission line in water supply system of Houston, Texas.



Installation of cast iron pipe and fittings in large filtration plant in Chicago, Ill.

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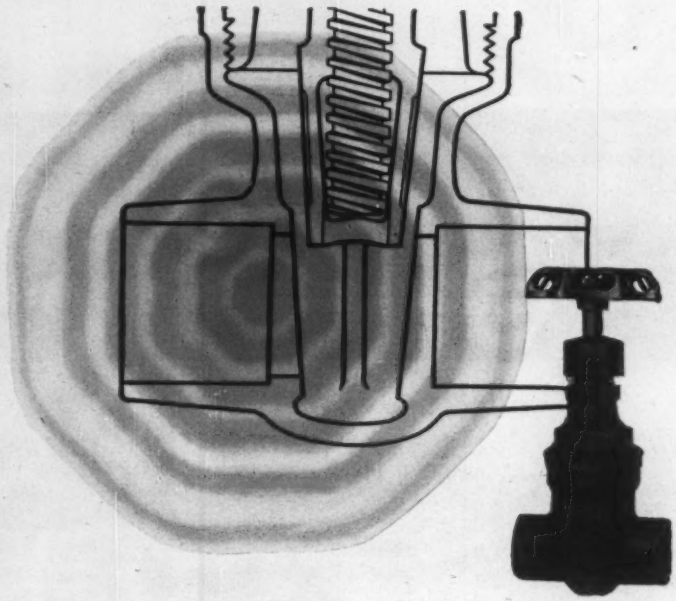
When the heat's on

you need the extra strength of

JENKINS

Solder and Socket End

VALVES



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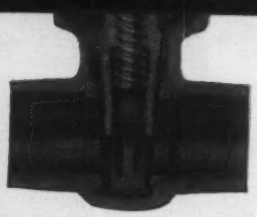
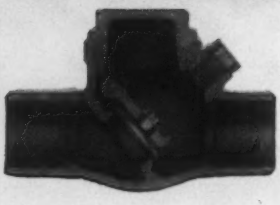
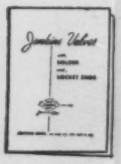


Solder End CHECKS

300 lbs. O.W.G.
¼" to 3"

Regrinding. May be easily reground without removal from line.





NEW BULLETIN Lists all Jenkins Solder End and Socket End Valves and gives complete instructions for soldering and brazing. Ask for Solder-Socket End booklet.

The "light-duty" look of copper tubing installations is deceiving. Valves must provide an accurate fit to tubing and *hold it* under the intense heat of soldering. And, because flexible tubing does not afford the rigid support of standard pipe, valves must withstand unusual strains in operation.

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For faster, trouble-free installation, and lasting economy, specify Jenkins Solder End Valves. Jenkins Bros., 100 Park Ave., New York 17.

JENKINS Socket End Valves

for Class B or IPS Tubing

Jenkins bronze valves with socket ends for silver-brazing are made in Globe, Gate, and Swing Check patterns to control compressed air, hot oil, and similar fluids in tubing hookups where specifications call for permanent, leakproof joints. Complete information in the Bulletin offered below.

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VALVES
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ENGINEERING NEWS-RECORD

Vol. 154, No. 22 June 2, 1955

Number of copies printed this issue, 67,714

INDEX

NATIONAL AFFAIRS

Records Are Set, Still States and Municipalities Don't Build Enough 21
Los Angeles City Council Approves Agreement for Sewerage Work Design 22
House Holds Key to Fate of Highway Plans 23
Bureau of Public Roads Reports to Congress on Toll Roads 24
Old Cavalry Post Becomes Jet Bomber Base 25
Firm Wins Extra Payment for Florida Bridge Job ... 26
Wires Break in Prestressed Reservoir 27

FEATURES

Ties and Floor System Come First in Erecting 3-Ribbed Arch Bridge 33
Spanish Bases Reach Construction Stage 36
Big Loops in Submarine Cable Lines Solve Mud Problem 48
Two New Bridges Span Delaware 51

NEW PRODUCTS

"Pry-Out" Puts Bigger Payloads in Payloaders 59
Ironmaster Machine Bends Rods at Site 62
Clamshell Provides Pressure Either up, Down or Forward 64

RESEARCH

Experimental Carrier Rides on Giant Air Pillows 66
Electron Microscope Cuts Time on Purification Tests 68

INTERNATIONAL

MacDonald Bridge Is Canada's Second Largest 73

MEN AND JOBS

Vancouver Engineer Sees Building Boom for Paper .. 87
Libbey-Owens-Ford Expands Its Engineering Department 88
Port of New York Authority Names Donald Lowe Chairman 92
Air Pollution Post Filled by Public Health Service .. 94

BUSINESS AND FINANCE

Commercial Building Boom Has Strong Backing 156
Brick Industry Is Expecting a Long-Term Housing Boom 157
A-Power Must Go Far to Beat New Coal-Using Generators 158
Private Lenders Outdo U. S. in Loans for Slum Clearance 158
FHA Withholds Commitments to Builders in 26 Areas 158
Activity This Week 160

LABOR

Buffalo, N. Y. Hosts Union Industries Show Featuring Bricklayers Competition 163
Strikes End or Continue Amid New Wage Demands 163
Building Trades See Need for More Vigorous Action 164
Area Bargaining Extended in the Plumbing Industry 164

Reader Comment 10
Washington Observer .. 19
Legal 100
Books 111
Construction Report ... 118
Unit Prices 154
Editorials 180

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 35¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

SAFETY CODE ACCEPTANCE—The model national building code of the National Board of Fire Underwriters is now in use in 900 cities. It also was reported last week at the board's annual meeting in New York that this year 26 cities adopted the code in full and 30 others accepted its abbreviated form.

IT'S ROUGH IN MASSENA—Groundbreaking ceremonies for the St. Lawrence Seaway, scheduled to be held at Massena N. Y. and Cornwall, Ont., on June 23 have been postponed indefinitely. It seems to be a matter of U. S-Canadian protocol and politics.

Much easier to figure out is why Massena (pop. 14,000) isn't in the best of circumstances for receiving visitors. In fact, labor people are saying they've never seen a place in rougher shape—worst problem is accommodations. Unions report workers paying up to $40 a week for room and board. And, the housing problem is only beginning, for there'll be about 3,000 workers in the area by mid-summer and maybe 10,000 by this time next year.

BARGAIN IN STREETS—The Tacoma, Wash., Public Works Dept. has an advertising campaign on to get property owners to join in financing a street paving program. "The city will give you approximately 40% of the cost of your new pavement," a sizeable newspaper display ad tells property owners. And, it goes on to give these details:

"You may now have permanent pavement under the following plans: permanent asphalt pavement with concrete curbs and gutters at a fixed cost of only $6 per front foot to you or portland concrete pavement with concrete curbs and gutters at a fixed cost of only $7 per front foot to you."

The city's 1955 budget contains a $95,825 item for participating in local improvement districts. An LID project must be initiated by property owners and approved by a majority of those affected by any proposed improvement.

CHALLENGE TO ROAD SAFETY—Motel and gas station operators and other roadside enterprises are giving the Florida Road Dept. a hard time because of its insistence that new and rebuilt four-lane highways have a median strip.

In emphasizing the importance of divided highways as a safety factor, Mel Connor, chief of the Highways Planning Division, told one delegation of objectors: "We cannot permit promiscuous left-turning on a four-lane highway. The road was planned for safety of motorists and is designed to move traffic."

AND, SPEAKING OF SAFETY—The New York Thruway Authority had its 380 toll collectors delivering a word of caution to motorists as they collected their tolls over the Memorial Day weekend.

BRUSH

ZULULAND
Brush 2500 KW back pressure steam turbo-generator set installed in sugar mill.

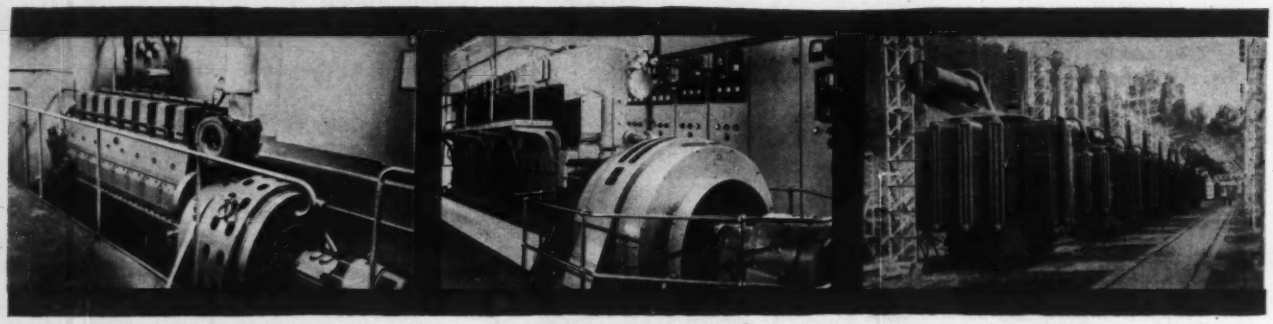
Petter

PERSIAN GULF
Petter 5 HP aircooled diesel driving well pump. (A Shell photograph)

McLAREN

THAILAND
McLaren/Brush 55 & 85 KW diesel generator sets for rural electrification scheme.

POWER *wherever in the world you want it!*



National

SOUTH AFRICA
National R4AU8 400 KW diesel generator set installed in a newsprint plant in Capetown.

Mirrlees

BRAZIL
Mirrlees/Brush KS8 1040 KW 400 RPM diesel generator sets with Brush switchgear installed at Santa Lina.

BRUSH

TASMANIA
Bank of 12 Brush 10,000 KVA single phase 11,000/110,000 volts power transformers.

In every part of the free world, power products of the Brush Group are at work raising agricultural and industrial output and standards of living.

The versatile Brush Group, with over half a century of international experience in manufacturing diesel and electrical power and equipment, offers you these services:

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Brush ABOE Inc.

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Construction will be on the rise over the next 18 months, regardless of a leveling off in housing. That is Washington's view, buttressed by developing plans of manufacturing industry to expand.

•

WASHINGTON OBSERVER

Another round of aluminum expansion is a certainty.

U. S. fabricators are scrambling for more material to make consumer goods. And the Air Force will need more of the metal immediately in its stepped up production schedule for the B-52 bomber.

Steel will expand another "round", too. The industry is running at near capacity now after the 1954 downturn, and most of the companies see a need for new ingot output as well as manufacturing equipment. Ben Fairless, who just stepped down from U. S. Steel, sees the need for a new Fairless Works every two years to meet rising demand.

•

More highways are going to be built. The Senate's vote this week on a new program gives the impetus to another round here (see page 23). No matter whether the Gore bill or the Eisenhower program, or a mixture of both, is finally voted, more money for roadbuilding purposes will be going out sometime after the middle of 1956.

Housing, itself, is leveling off, but that doesn't mean a slump. The Survey of Current Business (publication of the Commerce Dept.) foresees continued high demand. Currently, the demand is "very active." Simple reason: "American families need more space." Though marriages have dropped since the immediate post-war period that produced the baby boom, the birth rate "has been sustained by successive advances in second, third and fourth births."

Says the survey: For the next five years, new family formation is going to be relatively low; but it will rise after 1960 and go up substantially again after 10 years.

•

Short term, the future is good, if not spectacular: The slowing up of apartment construction in urban centers probably will be compensated for by the launching of slum clearance and urban redevelopment programs and also by neighborhood rehabilitation schemes.

Public housing will get a new stimulus. Congress will restore the 35,000 units-a-year program that President Eisenhower has recommended.

Consumer goods businesses—houses, autos, refrigerators, etc.—see the trend. The offers to unions from General Motors and Ford indicate a sureness of continued high levels of car sales. Whether there is a strike or not, the offers of stock-purchase plans, higher productivity wages, etc., reflect that Detroit sees business as good over the next five years.

Military construction will continue. Once the snag over racial questions is corrected in military manpower legislation in Congress, a program will be voted that will require more military installations.

Public utility firms are already in a new round of expansion. And next year is bound to see some big dam and irrigation projects coming up in the western states.

Added up, the Administration is confident about the business future. Advisers to the government are now sure of the last half of 1955; and they see no reason for a downturn later. On the contrary, they seen an upturn ahead.

PAVE Profitably

PAVE with any bituminous mix—hot or cold—with the world's most widely accepted bituminous paver. No other machine or method will lay bituminous mix as quickly, perfectly or economically.

PAVE smooth riding surfaces, even over irregular bases. Automatic leveling increases or decreases the thickness of the mat to compensate for depressions or bumps in the existing surface.

PAVE with easier, reduced rolling. The tamper operates at 1200 strokes per min., compacts the mat as it's laid, assuring uniform density, a better bond between courses, and better joints between strips.

PAVE a crowned or wedge-shaped mat with quickly adjusted screed. Each side of the screed is independently controlled. Adjustments easily made while machine is in operation.

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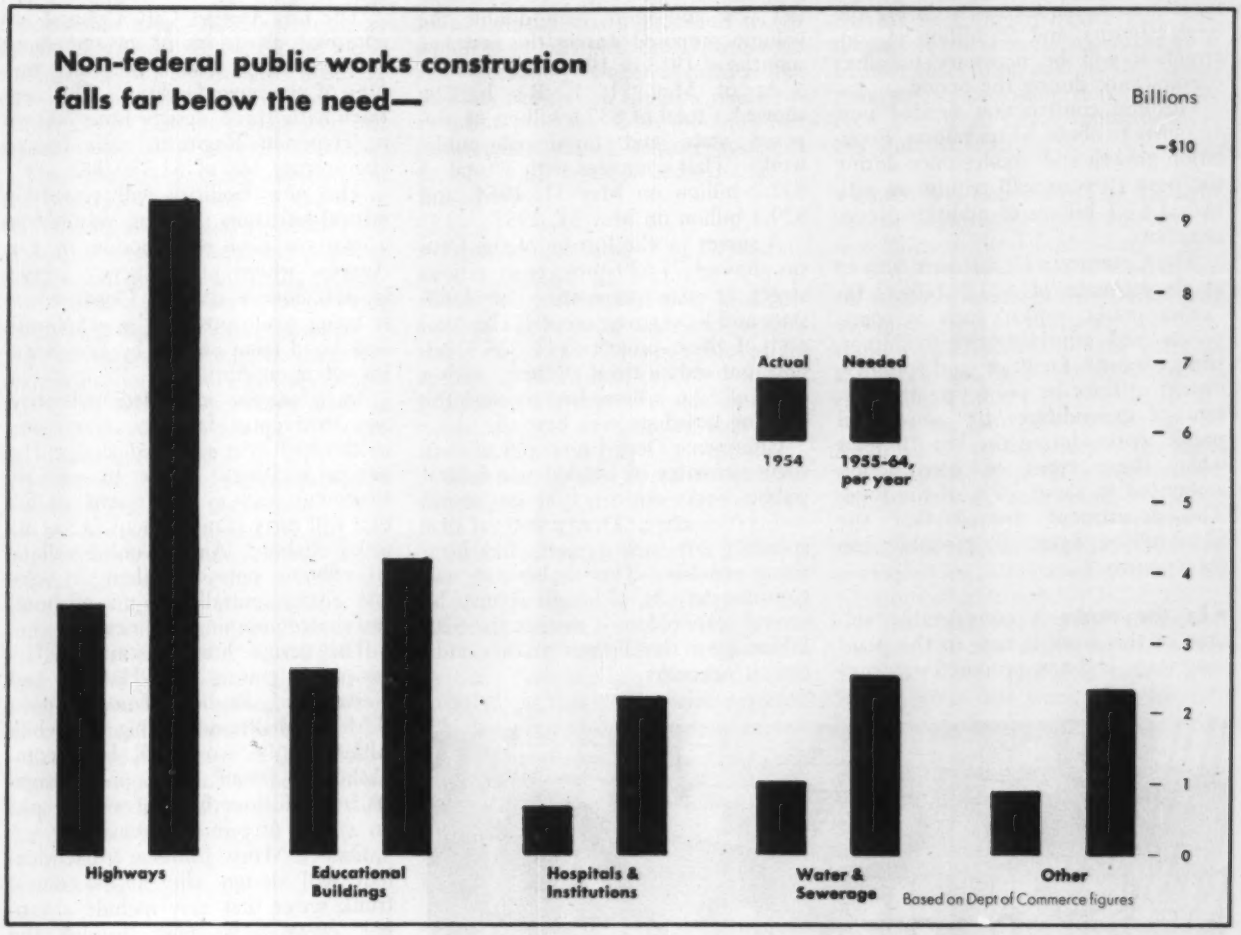


They're Setting Records, but Still . . .

States and Municipalities Don't Build Enough

Public works construction by state and municipal governments is expected to reach an all-time record of $10 billion this year. But even that high level represents just half the annual rate local governments should be building if they are to keep abreast of the need for non-federal public works.

A special survey by the Department of Commerce estimated that the U. S. will need $200 billion of new state and local public works during the next 10 years. The survey reported that this need must be substantially met to avoid "severe community problems."

Looking still farther into the future, the survey predicted an even greater need for new community facilities during the 1965-75 decade. It said the record 37 million births between 1945 and 1954 would result in a greatly accelerated rate of new family formation beginning about 1965.

• **Records fall**—The current deficit of non-federal public works has built up despite an unprecedented volume of this type of construction, during the last five years. Since 1949 there has been more highway construction, school and hospital building and water and sewerage facility work than in any previous five-year period in the nation's history.

Non-federal public works construction rose to a record $7.5 billion in 1953. The 1954 total was a new peak at $8.6 billion, and another big increase to about $10 billion is forecast for this year.

The $200-billion estimated 10-year needs include $92 billion for highways, $41.5 billion for educational buildings, $22 billion for hospitals and institutions, $25.3 billion for water and sewerage works and $23.2 billion for other non-federal public works.

The estimate of highway needs is based on the same studies as the 10-year $101-billion highway building program President Eisenhower submitted to Congress in February. The $92-billion figure was arrived at by eliminating right-of-way and other non-construction costs from the $101-billion total.

The estimate for educational buildings includes $31 billion for increased capacity and replacement of elementary and secondary schools—including private and parochial classrooms—and $10.5 billion for college and university construction.

There is now a backlog of needed

. . . Public works

water and sewerage construction amounting to $10 billion, according to the survey. An additional $9 billion of new construction will be needed to meet growth requirements during the next 10 years, and $6 billion of construction will be necessary to offset obsolescence during the period.

Hospital construction needed now amounts to about $13.5 billion. Population growth and obsolescence during the next 10 years will require an estimated $7.5 billion of additional construction.

The Commerce Department arrived at its estimate of $23.2 billion for "other public works" such as court, prison and administrative buildings, parks, transit facilities and publicly owned utilities by projecting the pattern of expenditures for non-federal public works during the last 10 years when these types of construction amounted to about 10% of the total. The department warned that the $23.2-billion figure is probably too conservative.

• **In the works**—A considerable volume of this work is now in the planning stage, and new proposed state and municipal construction is at record levels. Public works construction proposed by state and local governments during the first five months of this year add up to $5.3 billion. That is more than the value of similar work proposed during the first 10 months of last year and more than double the volume proposed during the first five months of 1953 or 1954.

As of May 31, ENR's backlog showed a total of $37.8 billion of proposed state and municipal public works. That compares with a total of $32.7 billion on May 31, 1954, and $29.3 billion on May 31, 1953.

A survey by the Bureau of the Census showed 71,639 projects in various stages of plan preparation by 4,000 state and local governments. The total cost of these projects was $25.3 billion, but only a third of them, with a value of $7.6 billion, had reached the drawing board stage or beyond.

Commerce Department officials say their estimates of needed non-federal public works construction are sound and conservative. They point out that spending for such projects has been rising steadily. They believe it will continue to rise, although it may be several years before it reaches the $20-billion-a-year level their studies indicate is necessary.

Formwork Collapses in Stadium

Seven men were injured in a formwork failure in the Kentucky State Fairgrounds stadium being erected at Louisville by Robert Simmons Construction Co. About 22 cu yd of concrete had been placed for a stadium floor when the formwork in two bays, with an area of about 1,000 sq ft, toppled to the ground. The plywood forms had been supported on 16-in.-deep, adjustable-length, open-web joists spaced 2 ft c-c and spanning 22 ft. Supports for these joists, in turn, rested on pairs of adjustable, 2-in.-dia metal-pipe shores 16 ft to 18 ft high, spaced 30 in. c-c. Cause of the failure in the formwork has not yet been determined.

City OK's Contract

Los Angeles City Council approves agreement for sewerage works design

The Los Angeles City Council has approved provisions of an agreement calling for the design of $40.7 million of sewerage facilities. The contract with three design firms known as Hyperion Engineers calls for an engineering fee of $1,359,000.

The new facilities will remedy a critical situation that has resulted in a ban on new construction in Los Angeles where proper sewer service is not now available. Construction is being made possible by a $60-million bond issue okayed by Los Angeles voters on April 5.

Included are expanded collection and interceptor facilities, conversion of the high-rate activated sludge Hyperion treatment plant to primary treatment and a new ocean outfall that will carry plant effluent five or six miles offshore. Also involved will be an effluent pumping plant, a separate sludge outfall (6½ mi offshore) and sludge pumping facilities.

The design firms making up Hyperion Engineers are Holmes and Narver, Inc.; Daniel, Mann, Johnson & Mendenhall, and Koebig & Koebig. Although the work will be accomplished by a staff made up of designers from all three firms, it will be split on a basis of prime responsibility.

Daniel, Mann, Johnson & Mendenhall will design the north central trunk sewer that may include a tunnel several miles long through the West Los Angeles hills. Holmes and Narver will be responsible for the ocean outfall design. Koebig & Koebig will see to programming revisions to the Hyperion treatment plant.

To oversee the design work, the Los Angeles Board of Public Works under its president, Cushing Phillips, will establish a consulting board. Any change that the designers find necessary to the plan as proposed by a citizens committee must first be okayed by the consulting board. All plans must be finally approved by the Board of Public Works.

The consulting board will consist of a representative of each of the design firms plus the two engineers who advised the citizens committee —Richard R. Kennedy of San Francisco and Richard Pomeroy of Pasadena. The sixth member of the board will be the city engineer.

The design firms are expected to expedite work on plans for the new trunk sewer and the treatment plant revisions with designs to be completed in 10 months if possible.

After the Senate Vote

House Holds Key to Fate of Highway Plan

House sponsors of the Administration's highway bill are hopeful that delegations from states with large metropolitan areas can keep the measure alive despite the Senate's 60 to 31 vote for a bill sponsored by Sen. Albert Gore, Tennessee Democrat last week.

Undoubtedly a strong influence on the Senate's preference for the Gore bill is that, as a general rule, the rural or least-populated states get a better break under it than under the Administration measure. This factor may not weigh as heavily in the House.

Whether or not the provision in the Administration bill giving states credit for toll roads already built is retained also will have a big influence on House delegations from states with big turnpike mileage. Such a provision could not get by in the Senate.

The financing features of the Administration's measure—calling for a federal corporation that would sell bonds for the program and thus circumvent the federal debt limit—took the brunt of the attack in the Senate. And it was Sen. Harry F. Byrd of Virginia, the Senate's fiscal watchdog, who spearheaded the attack.

Sen. Byrd charged that the Administration proposal for a special bond issue to service the program outside the federal budget would result in "confusion and the end of honest bookkeeping."

• **A five-year plan**—The Gore bill passed by the Senate provides for an $18 billion program over a five-year period by adding $12.2 billion to the current federal aid outlays.

It puts much less emphasis on the interstate system than the Eisenhower plan. Under the Gore bill, only $7.7 billion is allocated to the interstate system over the five-year period—this to be matched by the states on a 90-10 basis. Under the President's $101 billion, 10-year program, a $21 billion, 30-year bond issue would be earmarked for the interstate system, with the states putting up only $5 for every $95 of federal money.

The Gore bill would step up aid to the states on a 50-50 matching basis for primary, secondary and urban programs to the tune of $4.5 billion over the five years beginning July 1, 1956.

On the interstate aid, the step-up would be gradual—from $175 million a year in fiscal 1956 to $1 billion in 1957; $1.2 billion in 1958; $1.5 billion in 1959; and $2 billion in 1960 and 1961.

In order to win passage of the Gore bill, the Democrats had to junk some provisions adopted in committee. Main casualty was a provision which would have extended the Davis-Bacon Act (prevailing wage) standards for highway workers on the new road construction program. This provision was jettisoned when it became apparent that it would result in recommittal of the measure.

• **Truck weight limit**—The Democrats were successful in retaining a provision that for the first time in a federal bill deals with size and weight limits on trucks. This is achieved by specifying that funds can be withheld from any state that increases its maximum weights and dimensions over those in effect on July 1 of this year.

The Senate also voted to increase the mileage of the interstate system from 40,000 to 42,500 miles.

Struck out was a provision allowing the government to control the right to advertise along rights-of-way on the interstate system.

The Senate rejected an amendment by Sen. Francis Case, South Dakota Republican, that would have required vehicles using interstate system to pay an annual fee. Car owners would pay $4 a year. For trucks, fees would have ranged from $8 up to $200. Sen. Case contended the fees would yield $500 million added revenue to help pay for the program.

One difficulty with the Gore bill is that it contains no financing plan and thus would further increase the federal deficit unless a new tax measure is written. In the committee report on the bill, Senate Democrats indicated hope that the House tax writing committee would come up with a measure.

• **Construction industry ready**—The Senate Public Works Committee report on the bill said that information presented at hearings indicates that the construction industry is ready to take up "a greatly enlarged highway construction program."

The report went on to say that "the bill recommended will provide a lead time in excess of one year for preparation of initiating the program. Contractors could double their present capacity the first year with their present personnel and equipment and continue to expand in subsequent years. . . . The committee believes that the construction machinery and equipment industry has available, or can provide, adequate capacity to meet anticipated needs for an expanded highway program."

The Senate bill provided for reimbursing utilities for a portion of their cost of relocating in states that bear no part of the cost. It allows for 50% of such costs to be paid by the federal government, providing that it not exceed 2% of all funds apportioned to any state in federal aid.

• **House has four bills**—The spotlight on the highway program controversy now shifts to the House where a public works subcommittee is winding up six weeks of hearings that have taken testimony from 60 witnesses. The subcommittee is slated to end hearings this week and then turn its attention to writing a bill.

There are four bills embodying the Administration's approach to the highway program before the subcommittee but no measure resembling the Gore bill. Testimony from governors, municipal officials and state highway engineers has all leaned toward the Eisenhower approach.

There had been little testimony favoring the alternative approach until Sen. Gore appeared before the House group last week after his bill had cleared the Senate.

Sen. Gore could get some aid and comfort from the earlier testimony before the House committee of Robert Moses, New York State Commissioner of Public Works. While Moses went along with the Administration in favoring emphasis on the interstate system, he rejected the proposal of a federal corporation having the right to build toll facilities on a national basis. This is a field which should be left to the states and their subdivisions, Moses said.

Moses also opposed the Administration plan to give states credit on their interstate allocations for state-conconstructed toll roads. "The complicated credit system proposed in the Administration bill seems to me to be unworkable and to the extent that it gives credit for past completed projects, is controversial, undesirable and unnecessary," he said.

One of the main objections the House committee raised to the Gore bill was its provisions for stepping up matching by the states of federal grants on primary, urban and secondary roads. These are matched on a 50-50 basis and would call for the states to step up contributions at an annual rate of $200 million. Many House members feel the states have reached the limit of their ability to match and will not be able to avail themselves of increased federal aid.

Toll Road Study

Bureau of Public Roads reports to Congress on feasibility of toll roads

The Bureau of Public Roads considers the construction of toll roads an expedient to be adopted only to help meet the nation's serious shortage of main trunk highways.

That is the substance of the BPR report to Congress on the feasibility of toll roads and their possible effect on federal-aid highway programs. Congress instructed the Secretary of Commerce to make such a study when it wrote the Federal-Aid Highway Act of 1954.

BPR recommended that the present law forbidding the collection of tolls on highways built with federal aid be continued. But it suggested changing the law to permit the inclusion of toll roads in the 40,000-mi interstate highway system, provided they meet standards set for that system. This would make unnecessary the duplication of toll roads where the route of a toll road follows substantially that laid out for the interstate network. BPR found that all but 200 mi of the roads found to be feasible for toll financing in its study are along routes laid out for the interstate system.

• **Mileage of toll roads**—The bureau reported that on Jan. 1, 1955, toll roads completed in the U.S. had a total length of 1,239 mi. An additional 1,382 mi was under construction; 3,314 mi had been authorized; and 2,253 mi had been proposed by responsible public agencies.

Some of the authorized mileage has been found not to be feasible for toll financing, the report said.

In its study to determine how many miles of highway might be financed with revenue bonds, the BPR excluded all highways, either toll or free, on which improvements existing or programmed will be adequate for future traffic.

Excluding this mileage, BPR found that an additional 6,700 mi on the interstate system costing $4.3 billion could be financed through the sale of revenue bonds backed by tolls. This mileage was found to have a feasibility ratio of 1.5 or more, the criterion set for the feasibility determination.

Feasibility ratios were computed by dividing the estimated net income for 1978 (the mid-year of the period of bond amortization) by the annual cost of debt service. Interest rates were assumed to be 3.5 %; terms of bonds, 40 years; passenger tolls, 1.75 cents per vehicle mile; truck tolls 4 cents; concession revenues, 7% of gross from tolls; and operating and maintenance costs, 20% of gross revenue.

Last year the Department of Commerce made a similar study of toll-road feasibility and came up with a figure of 10,000 mi as self-liquidating on a toll-income basis (ENR Feb. 4, 1954, P. 21).

• **Disadvantages of toll roads**—A toll road, the BPR report said, "cannot serve all the traffic for which some routes must provide." Consequently, more mileage of federal-aid roads must be built in some regions to serve local traffic. "On the other hand, a properly located and designed free road can serve both through and local traffic."

"The first responsibility of operators of a toll road is to the investors." Interchanges providing access and egress must be placed only at infrequent intervals and at points where there is sufficient traffic to more than offset the cost of collecting tolls."

Because of this infrequent spacing of interchanges, the report said, "it will become necessary for public officials to develop traffic-collecting routes and perhaps paralleling routes that would be unnecessary were the more frequent interchanges characteristic of a free route available."

• **State control favored**—Finally, the report pointed out that "some of the adverse effects of toll roads on programming of highway improvements and many problems of integrating toll roads with public-highway networks would be greatly alleviated if the responsibility for toll roads were vested in state highway departments."

The full report is entitled "Progress and Feasibility of Toll Roads and Their Relation to the Federal-Aid Program." It is House Document No. 139, 84th Congress, 1st Session.

Steel Shortage?

A bad shortage of fabricated structural steel could develop if bookings continue to pile up as they have during the first four months of this year.

In that period, bookings totaled 1,030,395 tons, 10% more than the total tonnage shipped. In April, bookings were 46% higher than a year ago and 13% above shipments, according to the American Institute of Steel Construction.

There is some room for shipments to increase. The total for the first four months is down 16% from 1954's record high. But this is the first time since 1951 that bookings for the first four months have topped total shipments.

Two-State Turnpike

Toll highway in Georgia and Florida would open Gulf Coast resort area

As a result of the three-way deal that involves two states and a port authority, a 50-mi toll highway may be built connecting points in Georgia and Florida.

The toll highway—if financing arrangements are approved by the courts—will open up an area on the Georgia Gulf Coast between Brunswick, Ga., and Fernandia Beach, Fla. It will include four bridges—two of them major high-level structures over the St. Mary's and Amelia Rivers.

A bond issue of $25 million has been accepted by underwriters, pending court validation, and a construction contract awarded to Merritt-Chapman & Scott Corp. Engineers are Hazelet & Erdel of Chicago. A feasibility report is being prepared by Coverdale & Colpitts, New York.

Owner of the new road will be the Ocean Highway and Port Authority of Fernandia Beach, Fla. This authority, operating under a Florida legislative act of 1941, has entered into contracts with the states of Georgia and Florida whereby the authority will build the road and operate it for 12 months from completion. At the end of that time, the two states will take over their respective portions of the highway, along with any remaining bonded indebtedness.

The highway is expected to open up potential resort areas in both states not now easily accessible.

Ebasco Services Will Build Noxon Rapids Dam Project

Ebasco Services, Inc., New York City, has been awarded the contract to design and build the $79.5-million Noxon Rapids Dam project in northwestern Montana for Washington Water Power Co.

The first phase of construction—scheduled for a July 1 start—will include relocation of 17.5 mi of Northern Pacific Railroad tracks that begin six miles below the damsite. At the same time, clearing is expected to get under way on a 30-mi-long reservoir area behind the site.

The dam will be a 190-ft-high concrete and earth-fill structure stretching nearly one mile across the Clark Fork River, 23 mi upstream from the company's Cabinet Gorge Dam (ENR Dec. 23, 1954, p. 25). The Noxon powerhouse will contain four 100,000 kw generators.

The relocation phase will be completed in about 18 months.

RUNWAY EXTENSION at Offutt Air Force Base involved dredging a 60-acre lake and placing 3,382,000 cu yd of fill.

Old Cavalry Post Becomes Jet Bomber Base

The Indian fighters who built Fort Crook on rolling high land overlooking the Missouri River south of Omaha would have a hard time believing what modern contractors are doing today to remake the old Fort into a suitable base for a global Air Force fighting command.

What's happening is a complete remake of the geography of the area —including creation of a 60-acre lake in the middle of a cornfield and construction of a sizable hill. The purpose is to make possible a 10,000-ft runway to handle the huge bombers of the Strategic Air Command.

• **Shoehorn job**—Actually, what's being done under supervision of Army Engineers is to shoehorn the necessary facilities for Strategic Air Command's headquarters base into an area tightly restricted by geography and urban development.

Old Fort Crook, which became an aircraft manufacturing plant during World War II and then Offutt Air Force Base, is bounded on the West by two major highways, on the north by the urban areas of South Omaha and Bellevue and on the east by the Missouri River. On the south, a waterway known as Papio Creek, forms the boundary.

As the base stood at the end of World War II, its longest runway (running NW-SE) was 5,769 ft long, ample for B-29's but only about half as long as required for jet bombers.

Additionally, the two main hangars at the base were surrounded by a concrete apron covering 78,000 sq yd 6-8 in. thick. Adequate for World War II planes, this concrete would break up like rotten ice under the nearly 100,000 lb wheel loads of some of the planes used by SAC.

A headquarters building to house SAC's administrative offices is under construction. The building will have three underground levels and will be three stories high with four wings jutting out from the central section. The central section will be 597x68 ft. Three of the wings will be 69x176 ft, and the fourth wing will be 88x133 ft (ENR Feb. 3, p. 27).

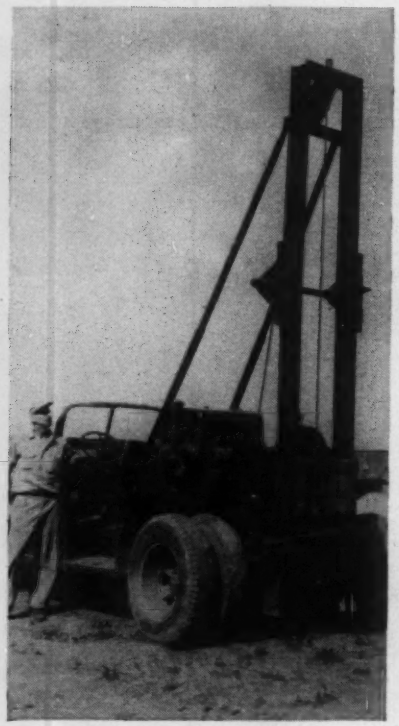
Various taxiways and other work also must be done. Probably not a single existing building on the base will escape at least alteration by the time the job is finished.

• **Fast work**—First project to go under contract was the administration building. The contract for this $8.7-million structure was awarded to the Robert E. McKee Construction Co., Santa Fe, N. M., one day after bids were opened April 5.

Under a tight time allowance that calls for completion of the building in 15 months with a $1000 per day liquidated damages condition, McKee flew project superintendent Carl Taylor in from a penitentiary construction job at Santa Fe, and he had excavators at work within three days of the time the contract was awarded.

Taylor is using every construction trick his firm learned on numerous hurry-up jobs for the AEC.

One of these will be an attempt to build the structure in sections, building all three floors of each section simultaneously to permit finishing work to proceed while workmen begin another three-story section. To facilitate this operation, plumbers and other craftsmen are already on the



CONCRETE BREAKER is an ancient truck with a pile driver lead and hammer.

. . . Jet bomber base

job making up standard assemblies that can be installed in units as soon as erectors have provided a place to put them.

To guard against one contingency, McKee already has set up a ring of wellpoints around the project to cope with possible groundwater problems. Greatest problem for the moment is obtaining steel for the structure.

• **Runway just as fast**—To make Offutt's main runway usable by jets it must be extended 4,231 ft. The difficulty here is terrain. The existing field is on benchland 35 ft above the Missouri flood plain. To extend the runway, therefore, it is necessary to build the hillside out toward the river.

To save material and time engineers called for this embankment in a wedge-shape with a 1-100 slope, tapering from 33 ft above the flood plain where it joins the existing runway to 5 ft above nearest the river. Despite the economy of this shape, the fill required was 3,382,000 cu yd.

At this point a combination of unexpected natural conditions and contractor ingenuity paid off. The general contractor on the field job, a joint venture of Kiewit, Condon-Cunningham of Omaha, based their $3.1-million low bid on placing the fill hydraulically. They let a sub-contract to LaCrosse Dredging Co. of Chicago which brought its 550-ton dredge up the Missouri from Alton, Ill., dredged a channel cross-country to the borrow area and began work.

The top 2 ft of the borrow area was silt considered too fine to be placed in the embankment. Beneath this was blow sand that met specifications requiring that the sand fill have not more than 20% passing a number 200 mesh screen. Part of the overburden was stripped by land equipment, and then it was found that the material was so fine that action of return water from the dredge could carry it off. Thus, mechanical stripping was held to a minimum.

Secondly, dredging showed that the blow sand was unusually abrasive but under the percolating action of water would pack so solidly that the dredging company could exceed specifications on density (90% modified AAHSO) without mechanical compaction.

Ingenuity in laying out the job also paid off. Ditches draining the fill area were led back to the borrow area so that pumping water could be reused. It had been planned to maintain the level in the dredging pool by pumping water from the Missouri River. But return water, plus natural ground water, proved sufficient, and the expense of pumping was saved.

Dredging went on continuously through the winter, the contractor finding that runoff was so fast and percolating action such that the water drained before it could freeze.

• **Homemade breaker**—Another bit of contractor ingenuity appeared when the Hallett Construction Company, Crosby, Minn., began its $632,178 contract for breaking up and removing the old 6-8 in. concrete.

Instead of using the standard crane and ball procedure, Hallett equipped an old truck with a double transmission that enabled it to move at speeds from a slow crawl to 60 mph. On the back-end of the truck Hallett mounted a pile driver lead and a one-ton hammer run by a winch operated motor.

In operation, the driver is able to point his truck on a course, set its gears in slow forward speed and go to the rear of the truck to operate the hammer. As the truck rolls across the pavement, it leaves a wake of broken concrete behind it.

Hallett's project superintendent, R. C. McConnell, calls the machine "as neat as the pocket on a shirt" and cites these advantages: cheapness, because the truck was a fugitive from a junk heap; speed, because the rig can turn out, McConnell says, twice the breakage of a crane and ball; quality of work, because the hammer permits excellent control of the breakage; operating economy, because only one operator is needed.

As to speed, the truck is so fast that it is laid off two days after each full day of operation to permit a dragline to remove the broken concrete. The rig will break 350 sq yd a day.

Since the work must not interfere with air operations, the job has to be done in sections so that planes may have access to hangars and to two of six fuel pumps at all times.

• **Other work**—Directed by Col. Thomas J. Hayes III, District Engineer of the Omaha District, the airbase modernization also includes: jet fuel storage facilities for 5,000 barrels of fuel under contract to Natkin Construction Co. of Omaha; a dispensary and flight surgeon office under contract to Korshoj Construction Co. of Blair, Neb.; provisions for drainage storm water outfalls to Papio Creek, to Oehring Construction Co. of Omaha; and an exchange and recreation building being built by Shelton Construction Co. of Omaha.

Most of this work is scheduled for completion before the end of September. Further work not yet under contract will include airfield lighting, a new crash and fire station and an addition to the bachelor officer quarters.

Firm Wins Extra Payment For Florida Bridge Job

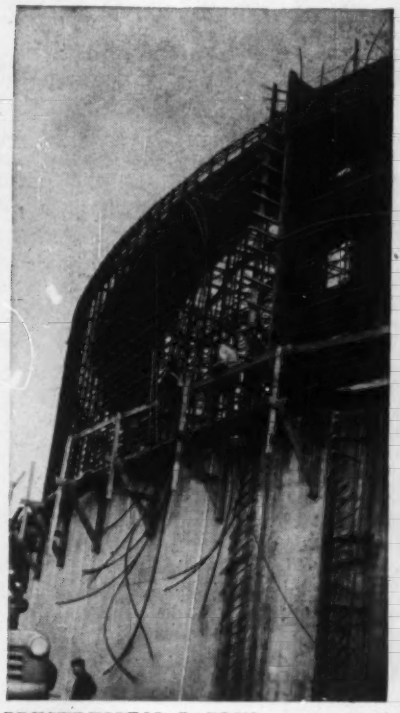
A circuit court at Jacksonville, Fla., has sustained an arbitration award of $298,274 to Merritt-Chapman & Scott Corp. for additional work on the John E. Mathews Bridge in Jacksonville.

The contractor claimed the additional compensation on the grounds that preliminary borings supplied by the State Road Department were inaccurate and caused delays in construction (ENR Feb. 24, p. 23).

A board of arbiters announced the award last December. The State Road Board then took the case to the Duval County Circuit Court on an appeal, and the court sustained the award.

House Extends Research Act

The House of Representatives has passed a five-year extender of the Saline Water Act of 1952 under which the government for the past three years has been subsidizing research into the making of fresh water from brackish water. The present law does not expire until June 30, 1957, but extension this year is considered necessary because research contracts ordinarily take about two years to complete. Hence, extension will permit the placing of additional research contracts and allow uninterrupted continuation of the existing program.



PRESTRESSING CABLES were set in the walls before concrete was placed (left) and tensioned after the concrete hardened. They were not grouted in, and five months later some were found corroded and broken. Most were easily removed, but a few jammed and had to be removed through holes in the concrete (right).

Wires Break in Prestressed Reservoir

The contractor erecting the 12-mg Richmond reservoir for the East Bay Municipal District (Calif.) is replacing the cables used to prestress its concrete wall following discovery that many of the wires were broken. The wires had been tensioned but not yet grouted in place.

The Richmond reservoir is 200 ft in dia. Its wall, 43 ft 8 in. high, is prestressed circumferentially with 360 parallel-wire cables, each extending over an arc of 90 deg. The cables are fastened at the ends with conical concrete anchors in eight concrete pilasters.

Positioned in the wall before concrete was placed, each cable consists of 18 high-strength steel wires, 0.196 in. in dia and is enclosed in a 1½-in. I.D. metal tube to prevent bond with the concrete before prestressing (ENR May 20, 1954, p. 32). Atop the wall is a thin-shell concrete dome with a prestressed concrete ring girder.

• **Wires corroded**—Prestress was applied after the wall concrete attained sufficient strength. Wires in the dome ring were promptly grouted in, but the wires in the wall were not because they had to be re-tensioned to offset higher stress losses due to more friction than anticipated in design.

When this re-tensioning was started five months later, a number of the wall wires were found corroded and broken. This discovery led to the decision to replace the original cables. By the time replacement work started, 11 months had elapsed from the time the first cables were tensioned.

Nearly all the cables were removed without great difficulty. Of the 168 cables removed to date, only six required cutting into the wall. In those cases, the jamming was caused by tearing of the spiral tubing, the fragments of which formed a battered plug.

During the replacement operation, it was found that most of the cables had some wires broken, some had all 18 wires broken and many wires had ruptured in more than one place in their 170-ft lengths.

• **Need for better grouting**—Because of the interest aroused in this failure, an investigation was made of the tendons in the dome ring of another reservoir now being constructed by the East Bay District. A hole cut in the concrete revealed the wires to be in good condition. But it was found that the thin grout had segregated, leaving a small area in the upper portion of the tube filled with water.

R. C. Kennedy is chief engineer of the East Bay Municipal Utility District. Erickson, Phillips and Weisberg, Concord, Calif., is the contractor for the Richmond reservoir.

Fill Is Free, But—

Voters approve contract giving builder free fill in return for land, work

Alameda, Calif., voters have approved a contract with Utah Construction Co. which will allow the company to dredge 36,000,000 cu yd of sand from city-owned tidelands to use as fill for a $75-million residential development.

The vote at a special election last week upheld an ordinance passed by the City Council in March. The question was submitted in form of a referendum to uphold or reject the council action.

Utah plans to fill 350 acres of tidelands it owns along the south shore and 870 acres at Bay Farm Island, located across San Leandro Bay from Alameda. The company expects to build 1,200 homes on the south shore and 3,200 homes plus a number of apartment houses at Bay Farm Island.

Property owners on the south shore opposed the contract on the grounds that the development would lower their property values and ruin the marine view. They also contended the city should not give away fill that could be sold at a profit. This group formed the Civil League of Alameda to fight Utah's plans and brought about the election by submitting a petition bearing 3,050 signatures.

Under the contract, the construction company has seven years in which to complete dredging and filling. Utah will pay nothing for the fill but will compensate the city by providing land for a perimeter road, filling certain adjacent city-owned lands and developing an extensive public beach. The company also agreed to sell a minimum of 28 acres of land in fill areas to the city for parks and school sites at $2,500 an acre. This option price provides that the land will be improved by streets, curbs, gutters, sidewalks, sanitary sewers and storm drains at no cost to the city.

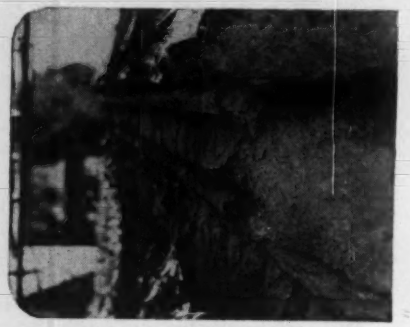
South shore property owners are safeguarded by a provision for a transitional strip between the existing residential area and the proposed development.

Utah will post a bond to insure the effectiveness of dikes and slopes against encroaching waters of San Francisco Bay. There is a stipulation that this bond will guarantee protection against bay water for three years after all fill work has been completed.

Utah has ordered a $3-million sand dredge from Yuba Manfacturing Co., Benicia, Calif. The dredge will be equipped with a 36-in. suction pipe and 15,000 ft of 30-in. discharge pipe.

How to restore and preserve costly masonry structures with **D-J Mortar, Thorite, Thoroseal and Thoroclear** *even though masonry looks beyond repair!*

Second Episcopal Church of Boston, Brookline, Mass.



Only the bare skeleton of cornice remains after years of disintegration.

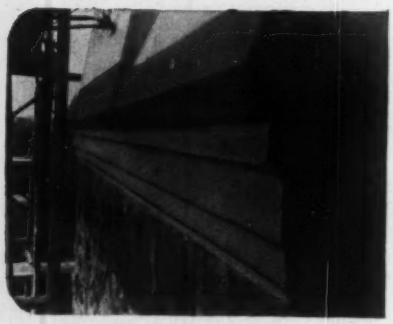
To repair, all loose material was cut out and complete surface was wire brushed in preparation of THORITE treatment.

Above photos show how vines grew over stone structure and hid most of damaged masonry.

Vines were cut away from building and disintegrated joints grouted with D-J Grouting Mortar.

Stone trim was then given two coats of THOROSEAL. Entire surface received a coat of transparent THOROCLEAR.

ALL MASONRY NEEDS PROTECTION



AFTER Brush and trowel coat of THORITE, nonshrink patching mortar was used to restore this masonry to its original lines. A two-coat application of THOROSEAL was applied to beautify and protect the surface. Nonsagging THORITE can be used to model any masonry structure back to its original lines.

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Combine's Bid on Dam Job Is Low by $17,613 Eyelash

A joint venture of Morrison-Knudsen Co., Inc., Peter Kiewit Sons' Co., Macco Corp. and Stolte, Inc. was low bidder on two of the three dams in the $52-million tri-dam project on the Stanislaus River in California.

The group bid $31.2 million for the job. The only other bidder was a joint venture of Arundel Corp., L. E. Dixon Co. and Guy F. Atkinson Co. This group's bid was $17,613.50 higher than the low.

Bids for the project were first opened April 21. At that time there was only one bid for the job—a $32.9-million tender from the high bidder at last week's opening. The bid was rejected because it was more than $1 million higher than the $31.8-million maximum established by the Oakdale and South San Joaquin Irrigation Districts (ENR May 5, p. 26).

In the second bid call, terms were eased to allow a net quantity increase and to provide incentive payments for early completion of the job. The construction will be financed by bond issues of the two irrigation districts authorized by voters three years ago.

$116-Million Toll Bridge Proposed for Puget Sound

The Washington State Toll Bridge Authority is looking into the feasibility of financing a $116-million bridge across Puget Sound west of Seattle.

The project calls for a 14,250-ft-long concrete floating bridge running from Seattle's Fauntleroy district to the northern tip of Vashon Island. A high-level suspension bridge would be built from Vashon to the Kitsap County mainland.

Earlier this year the engineering firm of Coverdale & Colpitts advised the authority that bridging would be financially feasible via either Bainbridge or Vashon Islands. But the firm also pointed out that the Bainbridge crossing would involve engineering problems because it would require building piers in tidal currents at depths of from 172 to 180 ft.

Fluoridation Program Upheld By Utah's Attorney General

Utah's attorney general has upheld the legality of compulsory fluoridation of public drinking water. His opinion stated that courts without exception have ruled that a properly administered fluoridation program comes within the police power of the state.

The ruling was requested by Governor Lee as a result of a controversy

(*Continued on page 30*)

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Site testing for the Golden Gate Bridge

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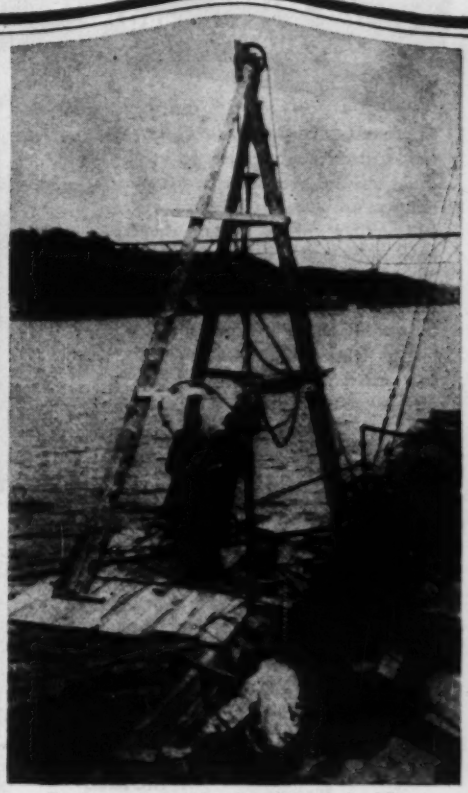

Testing bridge pier foundations for State Highway Commission, Poughkeepsie, New York.

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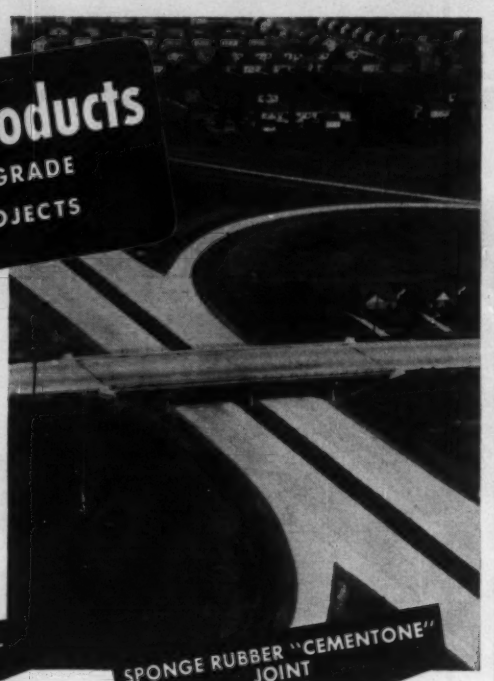
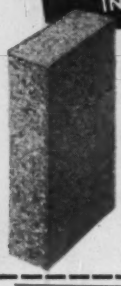


Concrete bridge and grade separation structures are subject to unusual amounts of movement due to temperature change, traffic stresses, and settling simply because they have to be built "up in the air." The following are a few of the Servicised Products which you can specify or use which will take this movement and yet keep your job sealed against moisture and attractive in appearance.

CORK and SELF-EXPANDING CORK JOINT FILLERS



Both types are non-extruding resilient and compressible, inconspicuous in color. Cork recovers 95% original thickness after compression; Self-Expanding Cork is treated to expand 50% beyond original thickness to keep joint filled regardless of contraction movement.

SPONGE RUBBER "CEMENTONE" JOINT FILLER

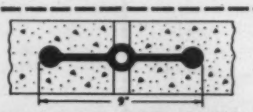
Fully resilient high quality blown sponge rubber "Cementone" blends with color of concrete. Uniform thickness and density. Available in varying degrees of compressibility to meet your requirements.

MOLDED PARA-PLASTIC

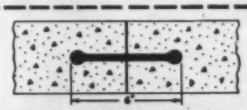
For sealing keyed construction or contraction joints in vertical walls. Maintains bond with concrete at temperatures down to sub-zero. Simple installation insures a resilient, moisture-tight seal of the joint.

PARA-LATERAL STRIP

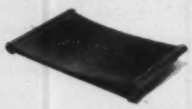
For sealing backfilled vertical construction or expansion joints in retaining walls, abutments, wing walls, foundations, tunnels, etc. against seepage to exposed side. Para-Plastic facing of strip insures permanent adhesion to concrete.



HOLLOW BULB RUBBER WATERSTOP
For permanent, watertight seals in expansion joints where a high degree of expansion and contraction is expected.



FLAT DUMBBELL TYPE
Flexible, elastic rubber with very high tensile strength for sealing construction joints.



SPLIT DUMBELL TYPE
Faster to install . . . eliminates split forms (1) Nail to bulkhead in form of a "T" (2) Section is poured and bulkhead stripped. (3) Divided section is joined together by stapling or with rubber cement.

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over the rights of a governmental agency to force fluoridation upon the people.

Legal arguments against the fluoridation program fall into several groups: (1) it jeopardizes constitutional rights by subjecting citizens to mass medication whether they want it or not; (2) it invades religious freedom of those citizens whose beliefs are opposed to taking medicine in any form; (3) there is no emergency or epidemic making such measures necessary; (4) the program is not designed to prevent contagion or infection.

S. C. Highway Department Wins Legislative Victories

South Carolina's Highway Department—the target of several attacks during the recent state legislative session—tallied up a number of victories by the time the legislature adjourned late last month.

One victory was scored with the defeat of a measure that would have prohibited the department from bypassing any city or town without permission of the town council and the county delegation of places affected.

A move to divert one cent of the state's gasoline tax from the department's jurisdiction also was defeated. The one cent has been used to finance the state's farm-to-market road paving program, but under the proposed bill it would have been turned over to the state's general fund to help offset an anticipated deficit.

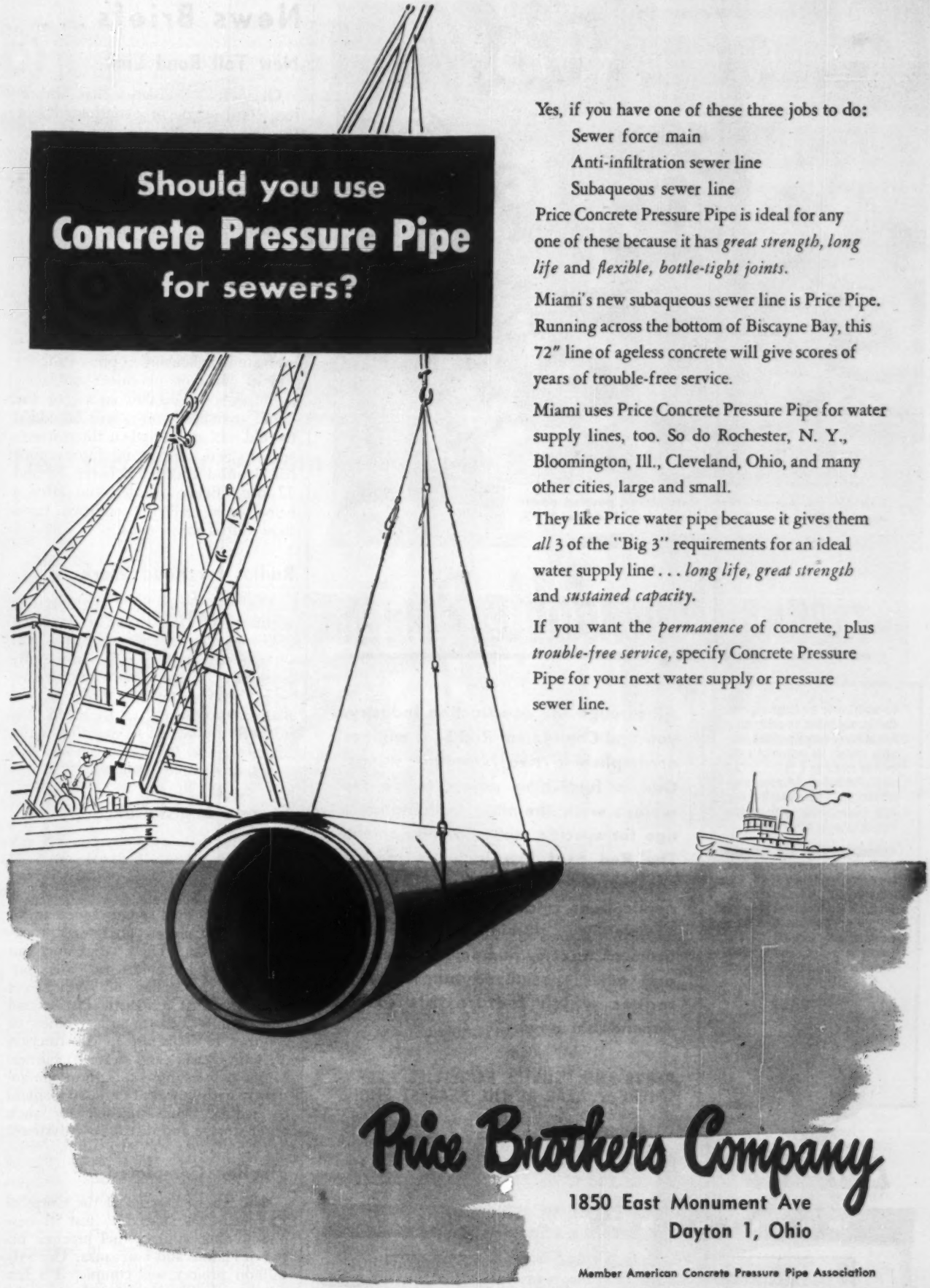
Two other moves against the department were defeated. One was an attempt to get the department to provide a breakdown on its expenditures when submitting its budget requests. Another bill sought to separate the highway department and the state highway patrol.

A bill to allow the state to build limited-access control highways was left dangling in the House, although it passed the Senate. As a result, no superhighways will be built this year despite the chief highway commissioner's belief that South Carolina is destined to slip far behind other states because most of the building money is going into old-type roads.

In other actions the legislature was responsible for:

- Adding about $17.3 million to the school construction program by raising the bond limit to $137.3 million.
- Defeating new water policy bill.
- Defeating a move to repeal the state's right-to-work law.

Left dangling were bills to provide air pollution control districts in each county, and a measure setting up age requirements, fees and other controls over architects in the state.



Should you use Concrete Pressure Pipe for sewers?

Yes, if you have one of these three jobs to do:

Sewer force main
Anti-infiltration sewer line
Subaqueous sewer line

Price Concrete Pressure Pipe is ideal for any one of these because it has *great strength, long life* and *flexible, bottle-tight joints.*

Miami's new subaqueous sewer line is Price Pipe. Running across the bottom of Biscayne Bay, this 72" line of ageless concrete will give scores of years of trouble-free service.

Miami uses Price Concrete Pressure Pipe for water supply lines, too. So do Rochester, N. Y., Bloomington, Ill., Cleveland, Ohio, and many other cities, large and small.

They like Price water pipe because it gives them *all* 3 of the "Big 3" requirements for an ideal water supply line . . . *long life, great strength* and *sustained capacity.*

If you want the *permanence* of concrete, plus *trouble-free service,* specify Concrete Pressure Pipe for your next water supply or pressure sewer line.

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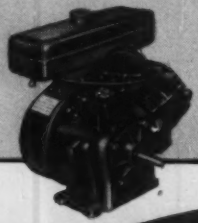
Concrete Pressure Pipe for Water Supply, Subaqueous, Pressure Sewer and Culvert Installations

Rex 3½ yd. Adjusta-Wate Moto-Mixer, pouring pavement in Milwaukee. Power, Continental Red Seal F140.

means Dependable Power

In addition to its large engines, Continental builds an outstanding line of heavy-duty air-cooled four-cycle models for industrial applications requiring 2 to 3 h.p. (AU series illustrated). Advanced engineering gives them easy starting, high dependability, and unusual lugging capacity at low speeds...

Options: patented and exclusive Contex® external ignition system, low-level ignition cut-off, 6-1 reduction gear, and other features. Available also for use on kerosene . . . For information on these models, address Air-Cooled Industrial Engine Division, 12800 Kercheval Ave., Detroit 15, Mich.



All through the construction industry, you find Continental Red Seal engines accomplishing two important things. One is furnishing power to do the world's work; the other, building prestige for specific makes of equipment. The Red Seal line includes models engineered to a wide range of building applications, and meeting those needs completely . . . turning more and more users of mixers, pumps, compressors and other specialized machinery to makes which feature this extra-dependable power.

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News Briefs . . .

New Toll Road Link

Oklahoma's legislature has authorized construction of a southern leg of the state turnpike system to connect with a projected Texas toll road. The new link will join the Texas road at the Oklahoma-Texas border, extend north to Oklahoma City and connect with the Turner Turnpike.

Ice Repellant Test

Rochester, N. Y., will be one of the first U. S. cities to test a German-developed ice repellant on its streets. To evaluate its efficiency in preventing ice and its effect on pavement and automobiles, some 19,000 sq yd of the liquid ($10,000 worth) will be added to cold mix asphalt when three streets are retopped. The ice-inhibitor reportedly is most effective between 18 and 32 deg. Below 18 deg and after a heavy snow fall the additive turns snow into a mush mass.

Radios for Road Work

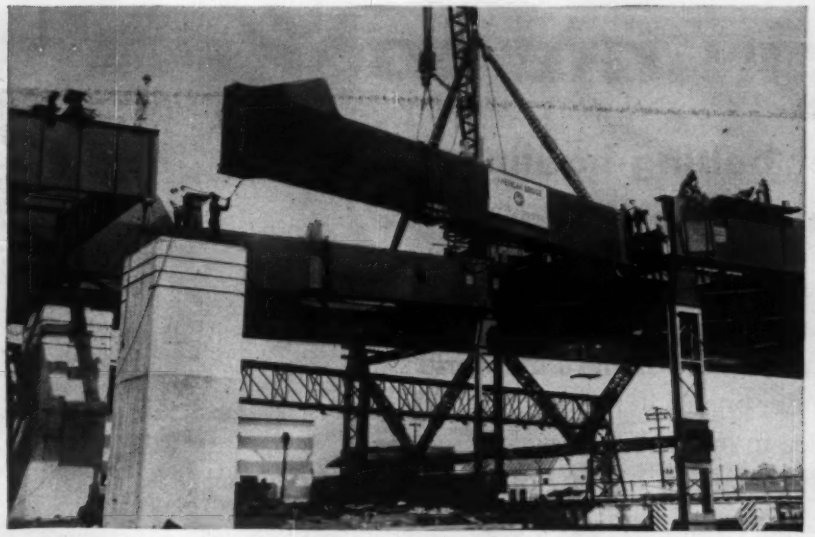
The New Jersey State Highway Department plans to setup a statewide radio network of five transmitters and 40 two-way mobile radio units. By permitting contact between department headquarters in Trenton and maintenance teams in the field, the network is expected to speed up maintenance work, transfer of equipment, and snow and ice removal.

Sewage Legislation

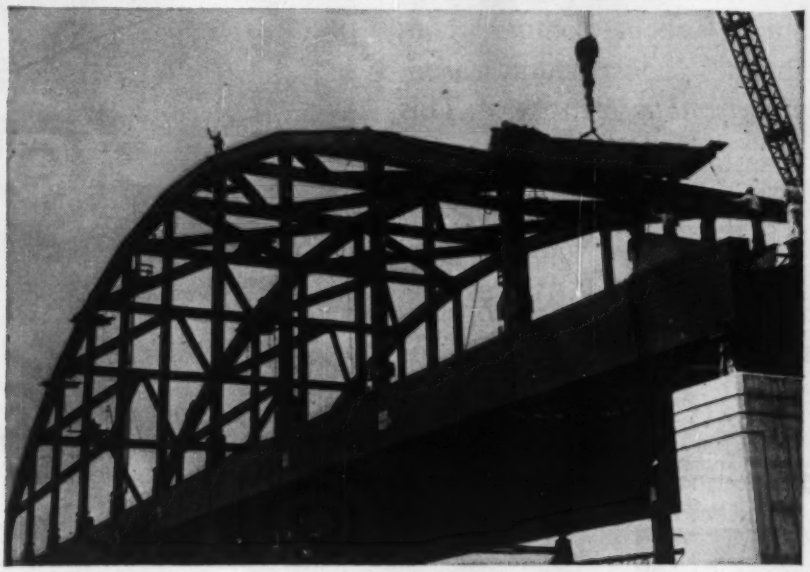
Two bills passed by the North Carolina legislature have strengthened stream pollution control in the state. One measure effects cities where voters have rejected bond issues to finance construction of sewage treatment facilities. These cities now can issue non-debt bonds for this purpose and pay them off with sewer charges against residents. The second bill permits two or more cities or counties to cooperate in construction of joint sewer and water facilities. Municipalities now can form an authority with power of eminent domain to acquire lands needed for such water storage and distribution systems.

Pipeline Completed

The Alaska District of the Corps of Engineers has started to test its new 625-mi-long military fuel pipeline between Haines and Fairbanks. The $40-million project was completed a few weeks ago. The line is expected to be in operation by this fall.



Ties and Floor System Come First . . .



. . . In Erecting 3-Ribbed Arch Bridge

The main span of the Myrtle Ave. overpass of the Jacksonville, Fla., expressway is a three-ribbed steel tied arch spanning 385 ft. Generally, arch bridges of this type have only two ribs, but this overpass is wide enough to justify a third rib.

The structure will carry six lanes of highway traffic over the Atlantic Coast Line Railroad tracks. Total length of the bridge is 1,430 ft, the approach spans being of plate-girder and rolled-beam construction.

Spaced 45 ft c-c, the arch ribs were placed on the outside and along the centerline of the bridge. There is a 2-ft sidewalk along the outerside of each roadway and a 3-ft mall in the center of the structure.

In erecting the steel for the main span, the American Bridge Division of U. S. Steel Corp. erected the floor system and hollow box arch ties before the ribs. Supported on falsework, the floor steel was set by a 50-ton derrick starting from one end of span.

On the way back to the starting point, the derrick erected the arch ribs and hangers. When the ribs were completed, they were connected to the ties, the hangers still remaining detached from the floor system. Then, jacks were attached to the hangers and the floor system pulled up so that it could be connected to them.

The bridge was designed by Parsons, Brinckerhoff, Hall & Macdonald, of New York City. Wainer Construction Co., Valdosta, Ga., is the general contractor.

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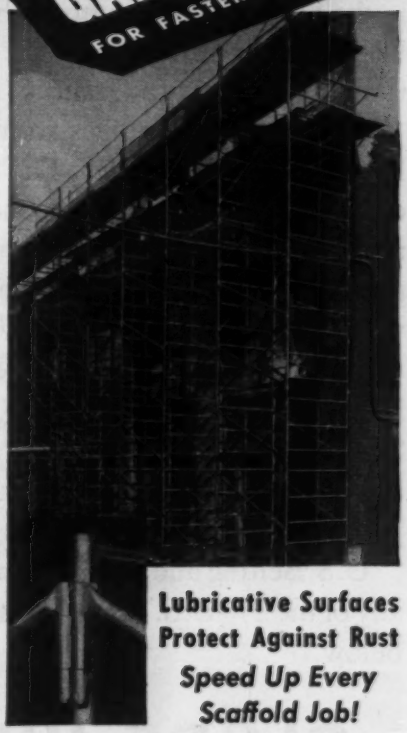

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IN THE AG

Here's U. S. Rubber belting hauling aggregate for Chief Joseph Dam

You're looking at one of the biggest aggregate plants ever set up. It supplies aggregate for concrete for the big Chief Joseph Dam in the State of Washington—the dam that will have the world's largest single-unit powerhouse under one roof, the dam that will rank second only to Grand Coulee in operating capacity.

This aggregate ranges from fine sand to heavy boulders as large as 20″ in diameter. The rock breaks clean, leaving sharp edges which are good for concrete interlock but bad for ordinary haulage conveyor belting. To handle this most critical portion of the haulage, United States Rubber Company conveyor belts were selected. Now in their fifth construction season, the belts are still going strong, giving *trouble-free* service. This is another instance of U. S. Rubber's Three-Way Engineering Service: "U. S." belt engineers work with the designers of the conveyor system and the engineers of the dam—to make sure of providing the *right* belt.

U. S. Belting and Engineering Services are obtainable through any of the 27 "U. S." District Sales Offices, or write to the address below.

CLOSE-UPS OF SOME OF THE CRITICAL POINTS

"U. S." Research perfects it
"U. S." Production builds it
U. S. Industry depends on it.

Close-up of shovel loading bank-run onto U. S. Rubber belt—first step on its journey throughout the aggregate plant.

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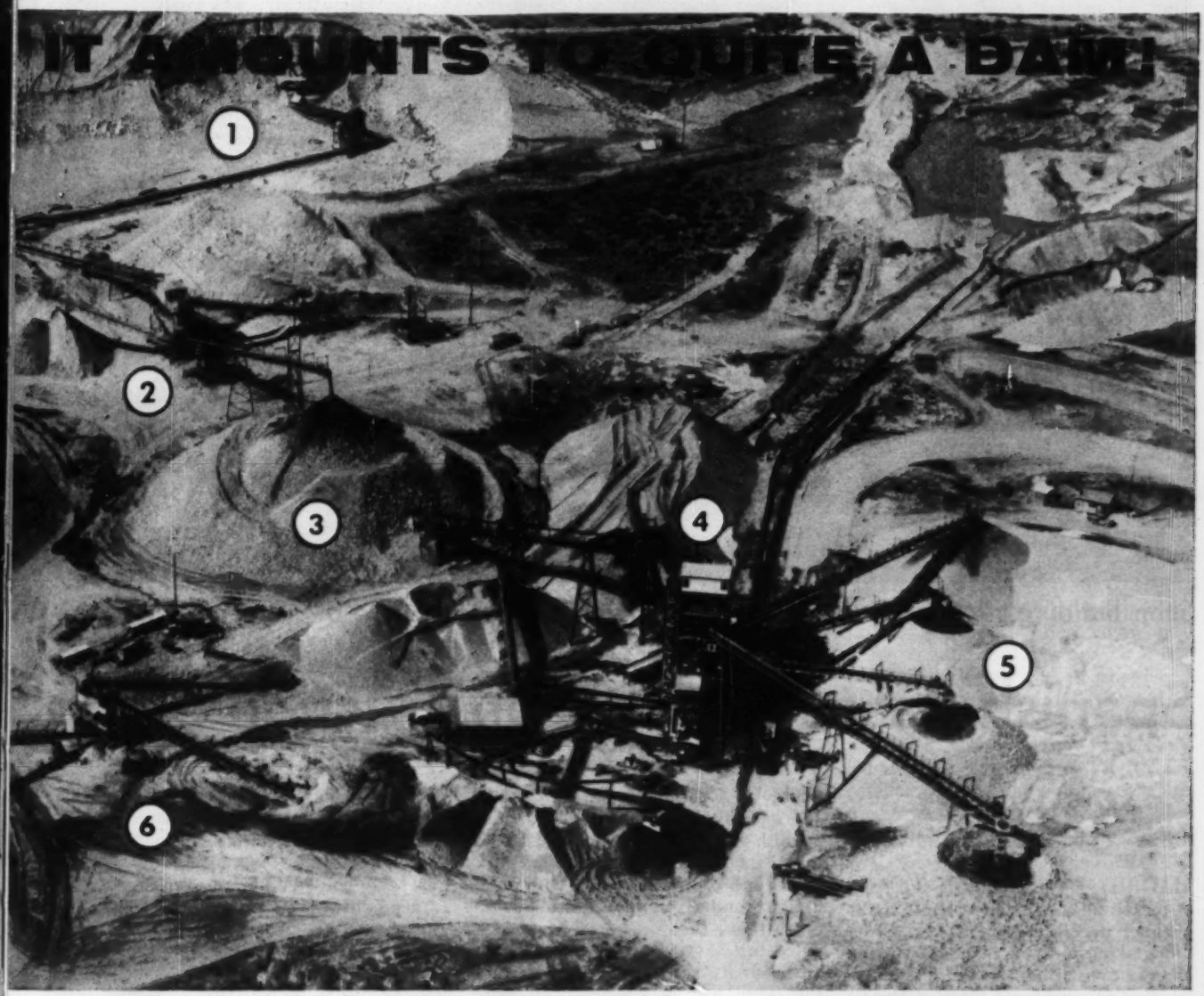
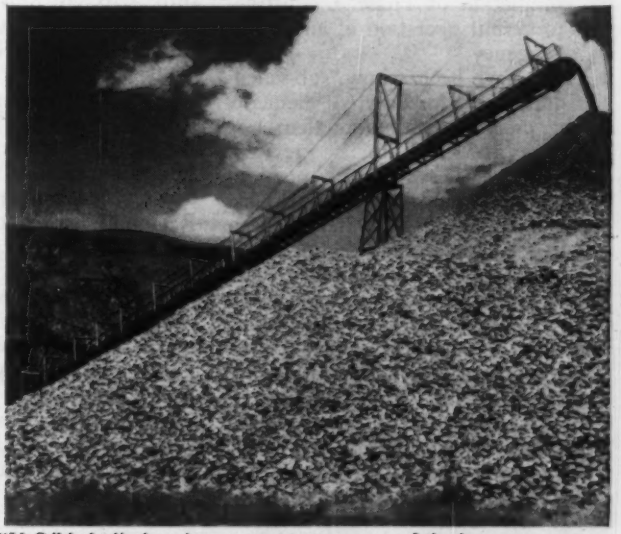


At pit (1)—shovel loads bank-run onto belt to crusher (2), which feeds minus 6-in. to stockpile (3). Material reclaimed from stockpile goes to top of screening tower (4), from which conveyors radiate to coarse-aggregate piles (5) and sand piles (6).

Note large and jagged aggregate on "U. S." belt. The belt starts the material from the pit to the rock plant.



"U. S." belt discharging aggregate onto one of the immense surge piles.

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Shop building for repair of construction equipment takes shape at Torrejon as . . .

Spanish Bases Reach Construction Stage

Waldo G. Bowman
Editor
Engineering News-Record

MADRID—This summer is the time of reckoning for the airbase and naval facility program that the U. S. is undertaking in Spain. What happens in the next six months will determine whether the military's target date will be met. That date is the fall of '56 for completion of Phase 1 construction to permit operation of aircraft in an emergency.

There have been many "sub-schedules" drawn up for different elements of the program, and more than one of these has had to be revised, prompting stories that the program was two or three or more months behind. Such delays have indeed been experienced, but so far only hopes and original expectations—no firmly committed schedules—have suffered. The only schedule that really counts is the one set for emergency operation of aircraft, and that one is still within reach.

There is general agreement that it will require special effort and some good fortune to finish some of the facilities as soon as desired, but the impatience of the construction forces to get contracts let and field work moving is an encouraging sign. There is no lack of push when there is something to push against.

• **The U. S. setup**—It has been about 18 months since the U. S. and Spanish governments signed the agreement permitting establishment of bases and providing for substantial military and economic aid to Spain. Since then, the Air Force has designated the Navy's Bureau of Yards and Docks as its construction agency; and the Navy has, of course, done likewise for its facilities. The bureau in turn selected four engineering and architectural firms to design the bases —Shaw, Metz & Dolio; Metcalf & Eddy; Frederic R. Harris, Inc.; and Pereira & Luckman, now known as AESB (Architects, Engineers, Spanish Bases). And it chose three construction companies to act as prime management contractor—Brown & Root; Raymond Concrete Pile Co.; and Walsh Construction Co., called BRW.

Representing this setup, an expanding group of Americans (now totaling about 600) has been wrestling long hours with policies, plans and problems incident to construction by Spanish contractors—and in some instances by joint ventures (empresa mixta) with American firms.

• **Where the jobs are**—The facilities upon which this energy is brought to bear extend nearly 500 miles diagonally across Spain from Cadiz in the southwest to Zaragoza in the northeast. In addition, there are naval facilities at El Ferrol in the extreme northwest and at Cartagena in the far southeast, plus maritime staging areas for construction materials at Tarragona (near Barcelona) and at Valencia on the Mediterranean.

Finally, in this initial program there is a POL (petroleum, oil, lubricants) pipeline, 475 miles long, running from the seaport at Rota (near Cadiz) to Zaragoza and serving all of the bases, of which there are six at present. A second phase program, sometime in the distant future, will add at least three more airbases; these, too, will be served by the pipeline.

Briefly reviewed, the pattern to which the initial six-base complex as planned is as follows: At Rota, on the Atlantic seven miles across the bay from Cadiz, a breakwater-protected port will be built to receive tankers feeding the pipeline and to service Navy aircraft carriers whose planes can be removed and towed to a nearby airbase, part of the same installation. Next in line, about 60 miles away, is San Pablo, the Seville municipal airport, which will be expanded to serve as the Air Force supply and maintenance base. Twenty miles south and east of San Pablo is Moron, the first of the bomber bases. And finally, far up the line, are the other bomber bases: one at Torrejon (12 miles northeast of Madrid) and two at Zaragoza.

ROTA, number one on the string of six bases, is both seaport and airfield for carrier-based planes, which will land on the finger pier and be towed to the field. Fuel tankers will unload at T-shaped pier connected by pipe to huge underground tank farm, start of the pipeline across Spain. Paved strip and hardstands beyond runway are proposed for patrol blimps. Rectangle between piers gives harbor scale; it's supposed to be the carrier Forrestal. This is primarily a Navy and Navy Air base.

• **First pictures**—What will be built at these bases is shown in the accompanying architectural renderings, which, it should be noted and emphasized, depict the ultimate development and not what is required to be built in the current construction program. First phase construction, in general, includes only the runway, taxiways, a third to a half of the parking aprons, and a few warehouses and living quarters. The ultimate development, in fact, may not come into being much before 1963, when the current agreement with Spain expires. (There is provision, however, for two 5-year extensions.)

The only probable future work not shown on the renderings is the extension of the bomber base runways to 15,000 ft. Their presently contemplated lengths of from 11,800 to 13,400 ft are adequate for B-47 jet bombers, but the longer runways would be desirable for the upcoming B-52's.

• **Historic connections**—Nearly every one of these U. S. installations in Spain has an historic connection that is familiar to every American, and in several cases is a part of his heritage.

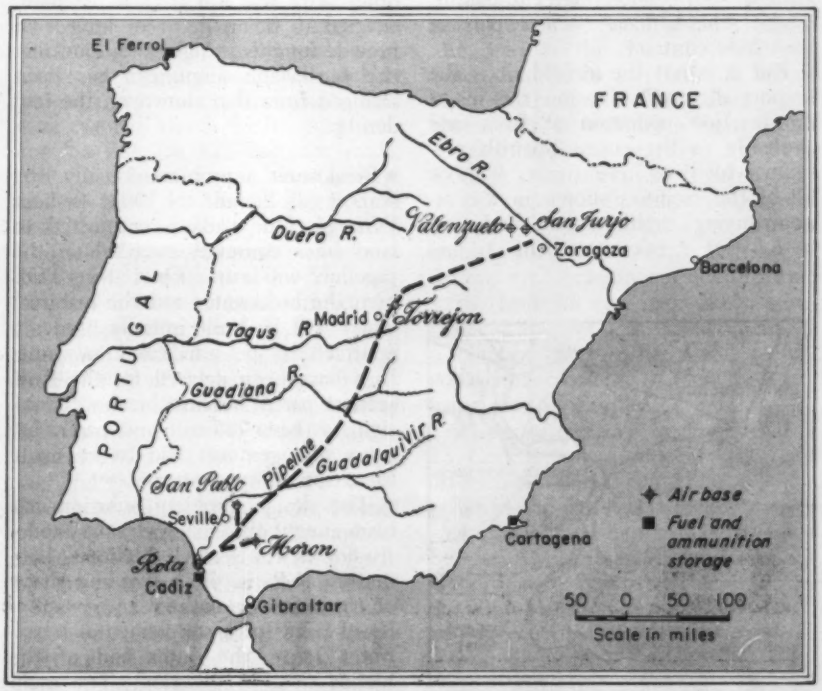
Rota, for example, is only a few miles down the beach from Palos from which Columbus set sail on his voyage of discovery. Seville, where the San Pablo supply base is located, was also Columbus' supply point, as it was later for Magellan whose ships set sail from there and returned in first circum-navigation of the globe.

But new history is in the making at these sites today—and the current chapters are being written by engineers and construction men. Their progress and the particular problems being encountered can best be appreciated by studying each base in turn.

• **The port of entry at Rota**—This is almost exclusively a Navy installation, consisting (see rendering) of a seaport and an airfield for carrier-based planes. A Spanish construction firm, Huarte y Cia, awarded the first-phase contract on the airfield for $1.75 million on March 30, established its headquarters and shop area and began moving dirt early in May. At the same time (March 29) another Spanish firm, Cubiertas y Tejados, was awarded a $1.5 million contract to produce crushed stone in a quarry about 30 miles away and deliver it to the job. It is estimated that about 1,000,000 tons will be required for the seaport and airfield.

Rota seaport is the key to the whole Spanish base setup as point of supply for the critical fuels and lubricants (POL) for the Air Force. In addition, it will be the only Navy air facility in Europe where carrier-based planes can be landed and serviced.

The airstrip at Rota will be 8,000 x 200 ft, with provision for future lengthening to 10,000 ft. It and its parallel taxiway will be connected to the seaport by a paved strip or "towway" 6,500 ft long, over which planes can be moved from the aircraft carriers for servicing or for operations



PIPELINE ACROSS SPAIN will be life-line of the Air Force and Navy bases. It will carry fuel 475 miles from the seaport to six bases—Rota, San Pablo, Moron, Torrejon, Valenzuela, and San Jurjo. Pipeline contractor has 425 days under dollar-peseta contract.

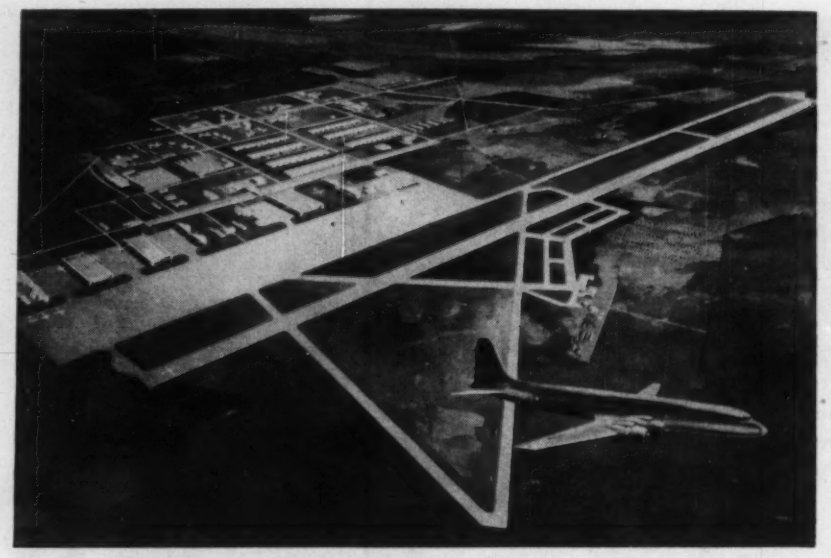
. . . Spanish builders learn how fast

from land. These facilities, plus a perimeter road around the reservation, are in the contract now underway.

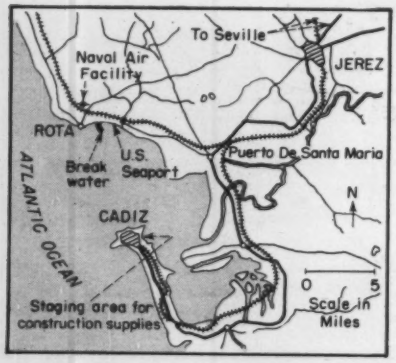
Constructionwise, this airstrip contract does not promise to be difficult. The soil near the beach is dune sand, and thus may have to have some clay mixed with it to get proper compaction under the tow-way. Before this is done, however, attempts are going to be made with vibro-compaction on the sand itself. The soil in the runway and taxiway area, back from the beach, is predominantly clay, which can be compacted readily in the dry weather that prevails from May to December. Maintaining optimum moisture content for compacting will be the principal problem.

• **Construction equipment is rented**—The contractor (as on all the bases) is well supplied with new or rebuilt U. S. equipment from Air Force stocks in North Africa or from the Bureau of Yards & Docks depot at Davisville, R. I. It is rented to him through the prime contractor, BRW. Initially he will probably move 400 to 500 yd a day with his 14-yd scrapers, but this output should improve as the operators gain experience. BRW, aided by equipment company representatives, ran a school for operators for several weeks. Similar instruction will be given in the operation of asphalt and concreting equipment. These schools have been a part of each base contract.

But it is not the airfield, it is the seaport that will occasion the major construction operation at Rota—and probably in the entire Spanish program. Involved, eventually, will be all of the facilities shown in the accompanying architectural rendering: a 6,850-ft breakwater bent around the roadstead area to protect it from open waters of the Atlantic, a triangular dredged-fill area between the shoreward part of the breakwater and the beach for warehouses and other buildings; a finger pier 300 x 1,200 ft, extending out from this area; and a marginal wharf 400 x 1,200 ft, on and beside the breakwater. Rather than as shown in the rendering, however, this wharf will be parallel to the finger pier so that aircraft carriers and other ships will not have to be maneuvered to tie up to it or leave. To provide for this straight-away docking, the breakwater alignment has been changed from that shown on the rendering.



SAN PABLO is to be the depot among the Spanish airbases, center for supplies and maintenance. Today it is the municipal airport three miles northeast of Seville, its main runway long enough for cargo planes to use. Construction starting will include portion of apron, cross taxiways, warehouses and rail plus highway access. Later phases will include maintenance hangars, other buildings.



COASTAL PORT at Rota—key to the whole base complex—has protection of Cadiz peninsula and the breakwater.

• **Breakwater a problem**—Finally, the seaport will include a 1,500-ft offshore POL pier for tankers, connected to land by a causeway over which the pipeline will run. Only this POL pier, the breakwater and the marginal wharf will be built initially, under a contract to be advertised in June. Bids have been delayed for the Rota seaport partly because breakwater design has been difficult and partly because arrangements had to be made for a special type of contract.

The design problem solution has been sought through hydraulic model studies in the French National Laboratory at Paris. Both size and shape of the main breakwater and possibility of need for a supplemental breakwater across the outer end of the harbor were in question. The main breakwater design has now been determined, and it has been decided that no supplemental breakwater is needed since adequate protection from southern storms is afforded by the peninsula on which Cadiz is located. Model studies showed that these storms could not make up in sufficient intensity in the seven miles of open water between Cadiz and Rota to cause any serious difficulty.

As to the special form of contract, the U. S.-Spanish agreement provides that all base work is to be done by Spanish contractors (to give them experience with modern construction practices) and is to be paid for in pesetas, except in those cases where it could be agreed that Spanish capabilities were insufficient. Then U. S. contractors could be brought in on a joint venture with a Spanish contractor, and paid for their participation in dollars.

• **Chance for European contractors**—Such an arrangement has now been effected for the Rota waterfront work, principally on the basis that no Spanish contractor had the equipment or organization to accomplish the construction alone within the time limit required. This was especially true for the dredging—6,000,000 cu yd in 30 months. In fact, for this particular job a special type of contract, not contemplated in the original agreement, has had to be provided to permit other than U. S. contractors to joint-venture with Spanish contractors and to be paid in dollars or other foreign currency. The reason for this is that it would probably be too costly for a U. S. contractor to bring dredging equipment across the Atlantic as compared with what it would cost,

MORON is for jet bombers—the B-47's and later on for the larger B-52's. Its 11,800-ft runway, probably of asphalt, will have concrete ends to withstand the jet blast. Its two connected parking aprons are designed to be 1,150 x 400 ft and 800 x 3,000 ft. Construction, which is about to begin here on grading, may be a two-shift operation in order to get the work done before the rains come next winter.

say, a Dutch or British contractor to move his equipment to the job.

When the Rota waterfront contracts are put out for bids, therefore, Spanish contractors will be permitted to join with any foreign contractor in submitting a proposal. The foreign participant will be paid in the currency of his choice, and the Spanish firm, as always, in pesetas.

Incidentally, these pesetas for all of the Spanish bases come from so-called counterpart funds. U. S. dollars go only to the Spanish government, for purchases of equipment and supplies in the world market. Purchased goods then are sold in the Spanish market for pesetas, which gives the government its funds (counterparts to the original dollars) to pay the Spanish base contractors—and also other Spanish firms that supply goods or services to the government, as for roadbuilding or railway construction, for example.

• **Water is scarce**—Looking at the whole Rota operation as a unit, development of an adequate water supply is likely to be one of the most crucial operations—a statement that can be repeated for nearly all of the Spanish bases. Already the hope for an underground supply has been abandoned. (A U. S. Army Engineer well drilling unit went down 800 ft with no success and moved off the base May 1.) The remaining hope is to bring in a surface supply from the Gaditana Aqueduct that serves Cadiz. This will be possible when a new mountain reservoir and pipeline under construction by that city is complete. Whether this will occur in time, without some special U. S. help, is an open question.

• **The pipeline across Spain**—Running a close race with the Rota facilities for being the largest and most difficult job in the Spanish program is the 475-mile POL pipeline, with its pumping stations and underground tank farms. Under a $5.3 million contract let last winter to the British firm of Steward & Lloyd for manufacturing and delivering 38,000 tons of seamless steel pipe of 8, 10 and 12-in. dia, stockpiling is nearing completion at Cadiz for the southern half and at Valencia for the northern half. Bids were opened March 23 for constructing the line (in 425 calendar days), and a combination of Merritt-Chapman & Scott of New York, Benson and Montin of Tulsa and Agroman Empresa Construccion of Madrid was low at $4.81 million—about $1.5 million under the engineers' estimate on this dollar-peseta contract.

A similar dollar-peseta contract will be let for all of the underground tank farms (bids asked May 18, with award to be made within 45 days). And a third contract of this type will cover the diesel-electric pumping plants. Operation will be at 60 cycles instead of the 50 cycles used throughout Spain. This same kind of current will be generated by the diesel-electric power plants to be built at each of the bases and by the steam-electric power plant planned for Rota.

As shown on the accompanying map, the pipeline will run from Rota to Zaragoza. Its route will pass in the vicinity of Seville, Cordoba and Madrid, and then go straight northwest to Zaragoza. Pumping stations will be located at Rota, the Arahal (northwest of Moron), Adamuz (north of Cordoba), Ciudad Real and Alcala de Henares (east of Torrejon). Beyond this point to Zaragoza there will be three pumping stations, two of which will be for reverse flow only. Shallow trenching will prevail on the pipeline—seldom exceeding 3 ft. Wheel-type ditchers will be used, but there will also probably be a considerable amount of hand digging. About 60 miles of the line is in rock.

Tank farms will be located at Rota, El Arahal, Ecija, Ciudad Real, Alcala de Henares and at Zaragoza. For a typical farm, as at El Arahal, for example, there will be (eventually) seven 80,000-bbl and four 13,500-bbl tanks. Much the largest tank farm will, of course, be at Rota to store the fuel as it comes from the tankers. It will be located about 1½ miles down the beach from the POL pier.

For the Phase 1 contract the successful bidder will have to furnish and construct about 50 tanks of various sizes, involving some 25,000 tons of steel plate, 1,000,000 cu yd of excavation and nearly 50,000 cu yd of concrete. Construction will require excavation of holes up to about 30 ft deep, laying a concrete base slab, erecting the tanks and backfilling.

• **San Pablo**—An essential element of any airbase complex is a supply and maintenance center, and in Spain this U. S. Air Force installation will be located at the Seville municipal airport known as San Pablo, which is also used by the Spanish Air Force. Since San Pablo was built in recent years to dimensions far beyond current needs—it includes a main 262 x 7,069-ft concrete runway, a 164 x 5,060-ft cross runway of concrete, and a 164 x 6,420-ft cross runway of asphalt—we would seem to be extremely fortunate to have obtained it for our use. Actually our good fortune stems from an error, for the original plans called for the development of a combination maintenance, supply and bomber base at El Copero, a few miles west of Seville.

The error occurred in assuming that El Copero was a suitable site from an engineering and construction standpoint in the early days before surveys were possible. When these were made by the AESB it was found that El Copero was potentially subject to flooding by the Quadalquiver River, and thus would require an extensive system of diking. Construction difficulties with the soil could also be foreseen. As a result, a revaluation was made and, after new negotiations with the Spanish government, the

. . . Bases in Spain have water problem

bomber base port of El Copero was moved 400 miles northeast to Zaragoza, where it will be placed adjacent to the other base there and called Valenzuela, while the maintenance and supply port of El Copero was relocated at San Pablo.

It is not entirely clear why San Pablo was passed over in the first place as the supply base, because it is such a logical solution to the problem. The existing runways are completely adequate for the heaviest cargo planes and will not be altered in first phase construction. Later the main runway may be lengthened to 11,300 ft. South of the existing facilities is a large area in which shops and warehouses can be ideally located.

An arroya across the site will have to be diverted and some filling will be necessary, but nearby are large spoil banks from an old canal excavation that need merely to be hauled into place. Finally, the soil at the site is a sandy clay that should compact readily for taxiway and apron construction.

Even water supply should not be the problem at San Pablo that it is elsewhere, since a pipeline supplying Seville from wells about 25 miles away passes the base and can be tapped with a spur line a few miles long. This is possible because the city has about completed a new mountain water supply and will not need as much of the well supply as at present.

The accompanying architectural rendering of San Pablo shows its eventual appearance. Not much of this will be brought into being in the first phase contract—a 500 x 300-ft concrete apron, a taxiway to connect it to the runway, four warehouses, railway and highway access lines and some POL facilities are presently contemplated. Bids have not yet been asked for San Pablo since the extra land needed is not yet available. Acquisition proceedings are underway but they require several months. Also, since time was consumed in getting Congressional approval to transfer our commitments from El Copero to San Pablo, and then to process the papers through the Defense Department and the Air Force, the start of acquisition by the Spanish government was delayed. It might be late summer before San Pablo contracts could be let.

TORREJON is for bombers, too. Its huge apron, 1,100 x 7,500 ft, is started under a contract for about half its length. Located 12 miles from Madrid, this base is on the site of Spain's aeronautical research station. An existing 4,266-ft runway will be incorporated in the 13,400-ft strip pictured.

• **Moron**—This is the Air Force's southermost bomber base, and it is located in virgin territory 25 miles southeast of Seville. Phase 1 construction bids were opened April 20, and the successful Spanish contractor was Agroman, whose bid of $2.56 million was $1 million below the engineers' estimates. He is presently moving his equipment to the job and may have to work two shifts to finish all grading and sub-base construction by Dec. 1, as required. This job, too, was delayed by land acquisition, but it is all scheduled to be available by May 20.

The Moron contract runs for 570 days and includes a 11,800 x 200-ft runway (asphalt except for 1,000-ft concrete sections at the ends) and about half of the widest of the two concrete aprons (some 500 x 1,500 ft in extent). In addition, through a change order, both highway and railway access lines will be built under this contract. The main line of the railway, which now crosses the site, will also have to be diverted around it, but it is possible that this will be done by the railway itself.

All in all, the Moron contract will require about 325,000 cu yd of cut and 275,000 cu yd of fill. The material is a heavy black clay, unmanageable when wet, which accounts for the need to finish the grading and compacting by Dec. 1 when rains can be expected. The clay also gets very hard when dry so maintenance of optimum moisture conditions may present some difficulties.

It may be appropriate to note the runway cross section required at Moron, since this is the same for all the bomber bases. For asphalt there is first a 14-in. selected material sub-base with a CBR value of 15. On top of this is a 10-in. sub-base A (CBR of 35) and then a 6-in. base course of crushed rock (CBR 80). The topping of asphalt is 4 in., put down in 2½ and 1½-in. layers. The concrete part of the runway requires a 9-in. sub-base of selected material and a 15-in. concrete slab. All sub-base and base course material at Moron must be obtained off the base.

Moron, along with Rota, promises to present a major problem of water supply. Test drilling to 1,000 ft has discovered no groundwater. The probable solution, since none other is yet in sight, is to build a 17-mile pipeline to tap the same Seville supply line being considered for San Uablo.

• **Torrejon**—Located near Madrid, this bomber base will properly be the headquarters of the whole Spanish base set up. It was the first contract let, its contractor, Fomento de Obras y Construcciones, receiving orders to proceed last Sept. 9, with a completion date set for March, 1956. The bid price was $3.5 million.

The Torrejon layout is notable for its huge concrete parking apron which, as depicted in its final dimensions on the accompanying architectural rendering, will be 7,500 ft long and 1,100 ft wide. A section full width and 3,600 ft long is in the first phase contract.

Another significant fact about Torrejon is that it already contains a 200 x 4,266-ft concrete runway as a part of the Spanish National Institute of Aeronautics (like the U. S. Air Force's setup at Wright Field in Dayton, Ohio) which has occupied the site. This runway, 11 in. thick at present, will be overlaid with 4 in. of asphalt

VALENZUELA AND SAN JURGO are two complete bomber bases laid almost end to end. San Jurjo was there as Zaragoza's municipal field. Its concrete runway will be overlaid with asphalt; apron and buildings are under construction. Valenzuela base will be built from scratch.

to give it a load capacity for heavy bombers, and it will be lengthened to 13,400 ft by extensions at both ends. These extensions will be of asphalt except for 1,000-ft end sections of concrete.

All this runway work plus the taxiways and rail and highway access lines are in the first phase contract. Totals involved are 339,500 sq yd of asphalt and 517,200 sq yd of concrete. Respective volumes are asphalt 37,510 cu yd and concrete 315,020 cu yd. Earthwork incident to pavement construction totals 702,730 cu yd of cut and 606,070 cu yd of fill.

Grading work at Torrejon is about 50% complete, and it was planned to start concreting work on the apron June 1. The contractor is moving over 10,000 cu yd of dirt on his best days, and with sub-base compaction proceeding at an increasing rate, asphalt paving plans are also being made. Currently under construction is a setup for processing aggregate for asphalt base course (a grizzly to remove stones over 4-in. size) and for concrete (washing, crushing and screening facilities).

Aggregate comes from a nearby river bed. After processing, it will be trucked to a storage and batching area. Concrete paving will be by two 34-E pavers.

The contractor's workmen are now being instructed in the operation of the pavers and the finishing machines, as they were previously in the operation of earthmoving equipment and compactors. The contractor has also hired an experienced American construction superintendent to advise him on organizing the paving job.

• **Weather a factor**—Torrejon, to date has not progressed as fast as had originally been hoped, largely because of abnormal winter rains (four times the 10-year average). The soil is a difficult-to-compact clay and in addition is underlaid by a much denser clay two feet down that defies quick drainage.

Water supply is also a problem at Torrejon, since underground sources are lacking, as revealed by four test wells. A surface supply can, however, be brought in from the Jarama River through a relatively short pipline.

Some building work is also under way at Torrejon. One structure is an equipment maintenance shop where BRW will carry out all major repairs on machines used on the bases in the northern half of the country. A similar shop will be set up in the south. Also at Torrejon a 150,000-sq ft warehouse was let April 7 to a Spanish contractor, Dragados, for $350,000. He will utilize a steel frame purchased by BRW for $98,000 on a low bid from a French firm.

These Torrejon buildings are the first to get under way in the Spanish program. Design work, however, is nearing completion with some interesting results. To save both space and money several buildings are being combined into one wherever possible. Thus the post office, post exchange and theater will be under one roof, as will the two headquarters of the Spanish and U. S. Air Forces.

Also on the buildings AESB is utilizing materials and construction methods predominate in the region of Spain in which they are located. For mess halls and barracks, for example, while the same floor plan is used, the walls are varied. At Torrejon, the red brick native to Madrid will be used, while at Zaragoza walls will be of the large yellow local brick. In the south of Spain, block or tile stuccoed with white plaster will be utilized for protection against the heat of the Mediterranean zone.

• **San Jurjo at Zaragoza**—A few miles north of the historic city of Zaragoza (300,000 population) will be one of the most unusual aviation installations in the world—two complete and separate bomber bases side by side and only 2,300 ft apart. Moreover, since their runways do not overlap, they will in the ultimate development extend for 30,000 ft or nearly six miles. A taxiway joins the adjacent ends of the two runways so that planes can be moved between the two bases which are named San Jurjo and Valenzuela.

San Jurjo is the site of the Zaragoza municipal airport (with a terminal building that any U. S. city of half a million population could envy) and also of a Spanish Air Force installation with a substantial layout of hangars and warehouses. The field has a 10,000-ft asphalt runway, a parallel taxiway of the same length, and five cross taxiways.

The Spanish contractor for the U. S. work at San Jurjo, Agroman, has been at work since last September under a $1.8 million contract (his third) calling for completion next December.

He has made good progress on his grading and compaction, having been favored with good weather and good material in the form of a fine granular caliche (40% passing the 200 sieve) which sets up hard when generously sprinkled. But he lost (through a guy cable failure) one of the towers of a two-tower slackline cableway he was using to dredge aggregate from the Ebro River, and is thus about two months late in starting his concreting. It is still believed possible, however, to meet the completion date by working his pavers 16 hours a day.

The Phase 1 construction at San Jurjo includes a concrete parking apron 3,600 ft long and 500 ft wide, and a 3-in. asphalt overlay on the existing runway and taxiway which presently consist of a 16-in. base and a 3-in. asphalt surface. Also included is a new drainage system and necessary conduit and piping for power, fuel.

The concrete apron will have a 13-in. slab on a 9-in. compacted subbase of selected material required to have a K-value of 500; plate bearing tests have consistently shown 700.

The selected sub-base material for

(*Continued on page 44*)

"LIKE THE SIDE OF A ROOF"

How Atkinson moved 1,500,000 cubic yards on the $4,000,000 Waldo Grade contract

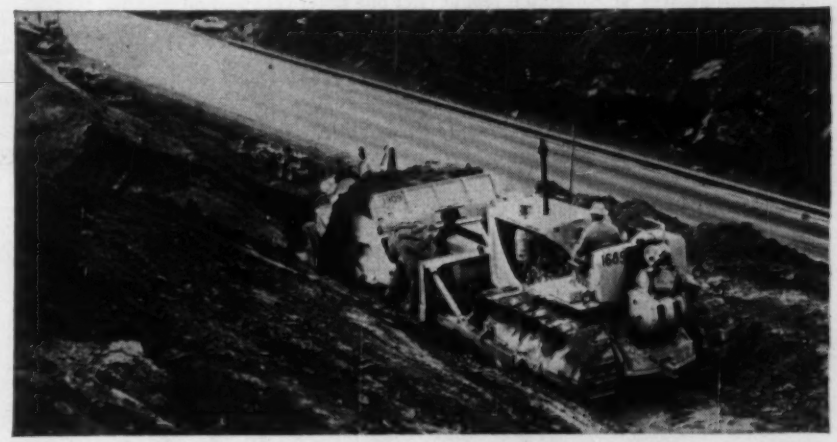
Even with a number of switchbacks, it took the rugged power of Cat DW20 Tractors to negotiate these grades.

The Waldo Grade project has been one of California's most important highway construction jobs during the past year. A serious traffic bottleneck had built up at the northern end of the Golden Gate Bridge, where 25,000 vehicles a day carry commuters from Marin County into and out of San Francisco.

Two new traffic lanes had to be added to Route 101, widening it to six lanes, and a second tunnel had to be driven through the mountain, providing three full lanes for both north and south bound traffic. Accomplishing these objectives involved cutting away a rocky hillside and moving the material—much of it heavy with copper, iron and magnesium ore—down to the fill in a deep ravine alongside the highway. About 1,500,000 cubic yards of earth had to be moved. This part of the contract, amounting to over $4,000,000, was handled by Guy F. Atkinson Company of South San Francisco.

An interesting factor in the job was the kind of grades encountered. "They were like the side of a roof," one observer reported. And the men who operated Atkinson's fleet of CAT* DW20 Tractors and No. 20 Scrapers agreed. The tough machines hauled big loads of fill down a slope that dropped nearly 600 feet in a little over half a mile. And on the return trip, empty, they had to make their way up the same 20 per cent grade.

Eleven of the DW20 wheel rigs were used on this contract. Other CATERPILLAR* equipment included four D8 Tractors for push-loading and bulldozing, two No. 12 Motor Graders to work on the haul roads and a Caterpillar D13000 Diesel Engine powering a Gardner-Denver air compressor. Approximately 80 per cent of the machines on the earthmoving job were Caterpillar-built.



A D8 with No. 8S Bulldozer push-loads one of the scraper units on Waldo Grade.

Many successful contractors have found it pays to standardize on the big yellow machines. Service and maintenance are simplified, many parts are interchangeable, and operators are familiar with the equipment. Caterpillar dependability, freedom from down time and long work life are clinching arguments for standardization.

A No. 12 Motor Grader levels fill and works on haul roads.

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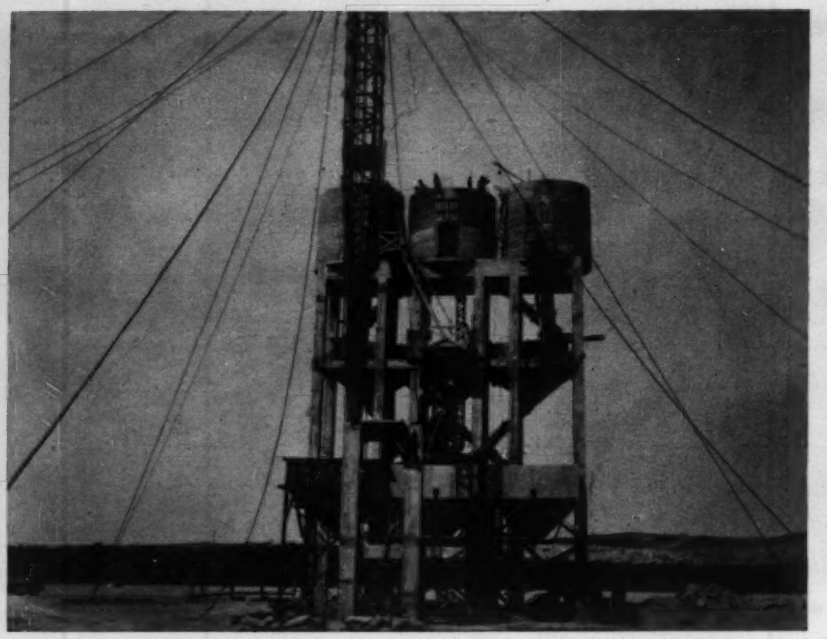

GRAVEL PLANT at Zaragoza is rebuilt after one tower collapsed on slackline excavator.

. . . How goes the program?

the San Jurjo apron is being obtained from between the existing runway and taxiway, where excavation is desirable anyway to permit installation of drainage structures.

Dug, hauled and spread by 12-cu yd scrapers, producing 800-cu yd per day each, the material is sprinkled and turned over by maintenance graders until thoroughly moist. Then light sprinkling of the surface is all that is required to maintain optimum moisture conditions during compaction, which is done in two 4½-in. layers by 60-ton compactors. Stones larger than 4-in. are picked out of the spread material by hand, rather than rehandling it to run it through a grizzly.

The contractor's river gravel plant is being rebuilt after the tower accident. When it is in operation each of the 1½-cu yd slackline buckets discharges into an elevated silo of reinforced brickwork, below which are screens to produce the sand and two sizes of stone required. In the meantime, from other emergency setups, he has been stockpiling aggregates so that concreting can start. All aggregate for the asphalt will be obtained from pits on the base, except the hard stone required for the top 1 in. which must be hauled from a mountain quarry and crushed to produce angular particles.

The contractor is establishing his asphalt plant between the adjacent ends of the San Jurjo and Valenzuela runways, where it can most efficiently serve both. The concrete batching facilities are in the Spanish Air Force area where an existing building is being used for cement storage and from which it will be taken to the batchers by belt conveyor.

San Jurjo will be the first U. S. airbase facility completed in Spain. It should be a good one, and it should not overrun its construction time.

• **Valenzuela at Zaragoza**—This is the bomber base, it will be recalled, that was originally planned for the El Copero site west of Seville. Although no call for bids has yet been publicly scheduled, designs are substantially complete. There will be a 12,000-ft runway and parallel taxiway, a 3,200 x 600-ft parking apron and the usual buildings, POL facilities and ordnance storage.

In contrast to the other bases, water supply for both Valenzuela and San Jurjo is assured by the nearby Imperial Canal which for several hundred years has been bringing Ebro River water that originates in the Pyrenees for farms and towns in the Zaragoza area.

• **El Ferral and Cartagena** — These bases will consist entirely of Navy service facilities—fueling piers and fuel storage. At both sites the Spanish government has been driving hillside tunnels for fuel storage, and it will be a continuation of this work plus precasting piles and pile driving that will characterize the construction jobs that will be coming up for these bases.

• **How then are we doing?**—From these descriptions of operations and progress at the several U. S. bases in Spain, there can perhaps be gleaned an impression of how the program as a whole is faring.

One would not be wrong if he concluded that progress had been disappointing considering the 18 months of work involved. Yet he would probably be unrealistic if he imagined disappointment could have been avoided by some other method of attack.

It is the history of such foreign jobs to encounter unplanned-for difficulties and delays. It is also a fact of history—and a characteristic of U. S. planning—to make too little time allowance for these unknown but inevitable contingencies.

That has been the case in Spain—as it was, for example, in France and North Africa. Here are some of the situations encountered in Spain that need to be kept in mind in evaluating the progress to date on our base program.

(1) The Spanish government, in agreeing to furnish all necessary land free of charge to the U. S., did not fully appreciate the cost that would be involved. It already owned the great bulk of the land, so did not plan for an expenditure of upwards of $20 million for the extra parcels.

Raising the money (a really sizeable chunk for Spain) and going through the legal processes of acquiring it has taken time. Moreover, except on the pipeline, fewer land owners than had been counted on offered to sell their land without going through expropriation proceedings.

Actually there is no reason to suppose that the time consumed in these operations could have been saved even if this problem had been foreseen.

And it is generally agreed that the Spanish government has done everything possible to speed up land acquisition—and with good results under the circumstances. In fact, so consistent have the Spanish been in keeping their promises that the Bureau of Yards and Docks and BRW, in order to speed up the program, have frequently let contracts before all land was available—and the "gambles" have always paid off.

(2) The designers in AESB, before they could proceed with the master plans of the bases, had to devote the first six months to developing basic information on such things as geology, water, tides, etc., and to mapping the areas to contour intervals that were useable. It was, of course, known that this would be the case but, with construction money already appropriated by Congress, the time consumed looked like delay.

(*Continued on page 46*)

Contract work on the Niagara River Remedial Project was directed by the district engineer of the Buffalo District, Corps of Engineers, U. S. Army.

Wire Rope at Work—Recently Norman H. McLain, Buffalo contractor, undertook the formidable task of diverting a portion of the swift Niagara River, just above the Falls. His was the job of exposing—temporarily—many acres of riverbed so that thousands of cubic yards of rock could be removed. Purpose: to create a more uniform distribution of water over Horseshoe Falls and thereby check the severe erosion at the center of the crest.

In constructing his diversion dam, McLain first erected a shield that was held in place by Bethlehem wire ropes, anchored upstream. In addition, to prevent lateral drift, a separate cable was run from the shield to a nearby point of land. This device, secured by the strong steel ropes, made it possible to construct the temporary dam, section by section, and thus assure successful completion of the project.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
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SPREADING SUB-BASE on apron at Zaragoza with a 15-cu yd carrying scraper rig, the Spaniards work like veterans.

. . . How Spanish-American relations fare

Under the agreement, AESB had to use Spanish engineers and architects to the limits of their capabilities. They found these capabilities excellent in so far as the individual Spanish firms were concerned, but also found that there were not enough such firms available to turn out the designs in the time available.

Most Spanish engineers either work for the government or for contractors so that there are only a few private consulting firms. There are more architects, but many of these were fully engaged on Spanish building work in which there is a considerable boom at present.

It took time to develop these facts on the extent of available Spanish design help, and the facts had to be plain and agreed to before AESB could expand its American design contingent. It employed 47 originally and now has 180. It also employs about 350 Spanish architects and engineers and utilizes some 500 more on the staffs of its Spanish design subcontractors.

Engaged to work a 48-hour week, AESB personnel has put in as many as 68 hours a week in getting out rush jobs.

Because of the size of the program, too, the design organization is frequently working on as many as 200 items at a time.

(3) The prime contractor, BRW, has also had to work long hours to get out the jobs for bids quickly, once designs are completed. BRW allows itself 10 days to draw up bills of material, make construction estimates and issue the building documents after the plans and specifications are received from AESB. This is done in an attempt to allow contractors ample time, up to 48 days, to figure their bids. Once bids are received, it was the hope that the contract could be awarded within 21 days, but this log time has generally been closer to 60 days because of the land acquisition problem.

Up to now, also, BRW has had to expend much time in aiding Spanish contractors to understand our competitive bidding methods, our rigid specifications and our heavy equipment operations.

That such aid would be given was, however, a part of the agreement, and the time required was amply planned for. It has also been eminently worthwhile, for the Spanish contractors have learned quickly. And being able construction people under their own methods, they have adapted themselves to big machine methods with enthusiasm. They have excellent top management and able field supervision, but have had to develop an intermediate level of personnel, which could plan and organize a mechanized construction job. Even in this difficult task they have made good progress, but it still remains a problem.

• **Mutual admiration**—Considering all of the possibilities for friction and misunderstanding in the Spanish-American relationships required by this base-construction program, a fact of over-riding significance stands out: The Americans continue to express, with great sincerity, their admiration for the design and construction ability of the Spaniards, for the industriousness and skill of the workmen and for the cooperative attitude of everyone. The Spaniards, on their part, after nearly two years of working with Americans, exude a friendliness for them that is apparently without reservation.

Such mutual admiration is much to be desired and its existence may well be more indicative of success for the Spanish program than would be a faster pace in building the bases at this stage.

The friendship of the Spanish people will be invaluable if we ever have to operate from these bases in wartime. A Spain as economically strong as possible is also to our advantage both in war and peace, and if our aid can be given in a manner and at a speed that builds this strength without creating resentment to the inevitable changes in some Spanish habits and customs, both Spain and the U. S. will benefit.

It would appear that these desirable objectives have been furthered by the manner in which the base building operations have been conducted so far. With the stage now so well set for construction, the evidences of progress should be more apparent from now on. And if the phase one construction program, as still seems possible, meets the scheduled completion date of the Fall of 1956, the individual delays that now cause disappointments will turn out to be unimportant.

Credit for advancing the Spanish base program to its present state, with Spanish enthusiasm and support still high, goes first to Maj. Gen. August W. Kissner, chief of the Joint U. S.-Spain Military Group who first brought the agreement into being and has since headed the U. S. operation. Much credit is also due to the Bureau of Yards and Docks construction leadership which selected an able architect-engineer group and experienced construction contractor and to the bureau's officer-in-charge of construction in Spain, Capt. William H. Godson.

Other individuals in positions of construction leadership in Spain who have contributed significantly to the program are Rear Adm. Robert H. Meade (Bureau of Yards and Docks), deputy for construction, and Col. Harold L. Kelley (Air Force), director of construction on General Kissner's staff; the resident officers in charge of construction on Capt. Godson's staff, Commanders Murrell (Zaragoza), Allegrone (Torrejon), McGaraghan (San Pablo and Moron) and Harris (Rota); the AESB project manager, John Stofka; and the BRW operating committee members, J. J. Collins, H. N. Hockensmith, E. M. Shanley and F. C. Schmitt.

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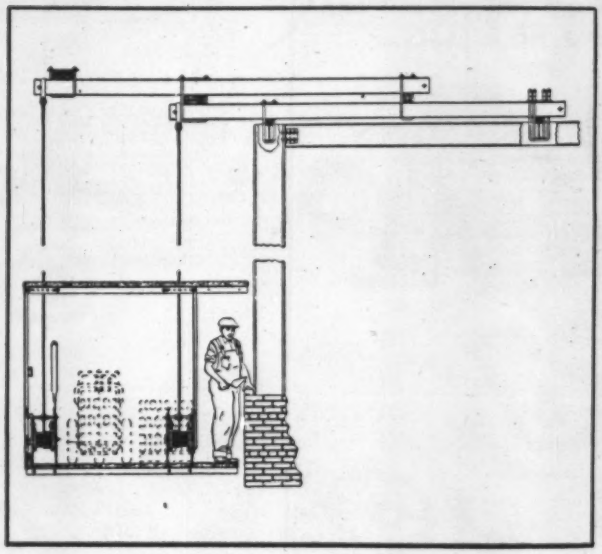
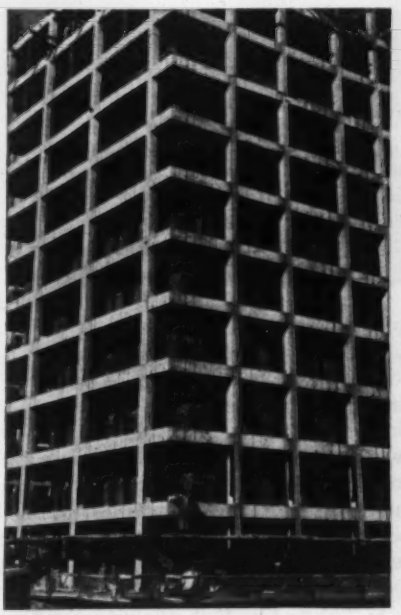
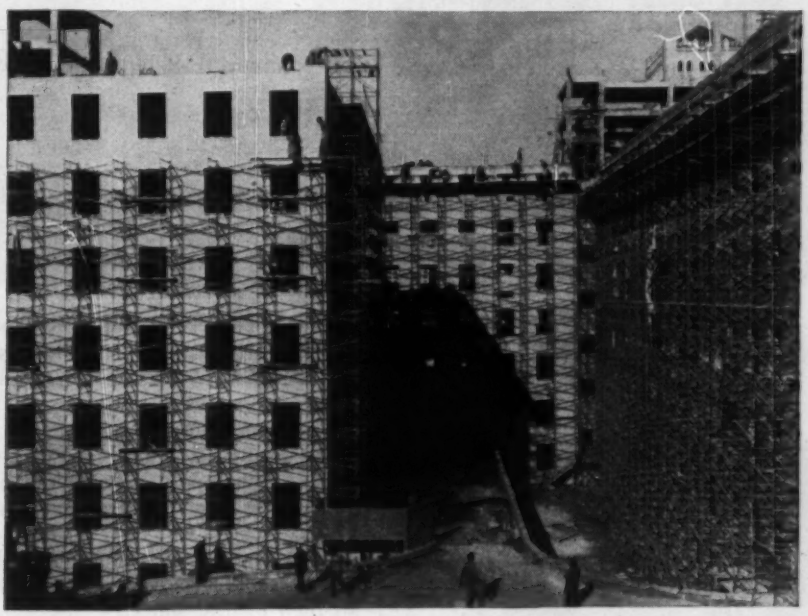
Scaffolding Methods . . . by Patent Scaffolding Co.



"LOW-DOWN" ON LOWER COSTS—Specially-designed Patent Scaffolding is making it possible for more masons and general contractors to take advantage of cost-cutting "mechanized" masonry material handling systems. "Gold Medal" Safety Scaffolding Machines easily handle the extra loads resulting from palletized masonry materials and also provide extra room for wheeling materials as well as free working space for masons.

ANOTHER MECHANIZED JOB—On Children's Hospital, Buffalo, N. Y., Metzger Construction Corp. gets top efficiency from mechanized handling system with extra-wide "Gold Medal" Safety Scaffolding Machines. These Scaffolds provide a clear 5'-wide area for maneuvering brick and mortar buggies and, with drum mechanisms set back from wall, give masons a clear 20"-wide platform.





SMART HANDLING—Palletized brick, lifted to floors and distributed near edges of building with hand-lift trucks, stand ready to be set by masons working from 5'-wide "Gold Medal" Safety Scaffolding Machines. M. & I. Rosen Co., Inc. is the mason contractor on this multi-building Newark, N. J. housing project.

NET OF STEEL—Prefabricated end frames and diagonal braces form a net of "Trouble Saver"® Sectional Steel Scaffolding around the Laboratory and Judicial Building for the State of Georgia in Atlanta. Thompson and Street, general contractors, used 1500 5'-wide end frames in erecting this scaffold for laying brick. Brick and mortar were lifted to working levels by hoist tower, center, and distributed to mason's positions along scaffold. This same type scaffold can be supplied in larger widths for mechanized handling systems and can be equipped with 20" sidewall brackets for supporting a separate mason's platform.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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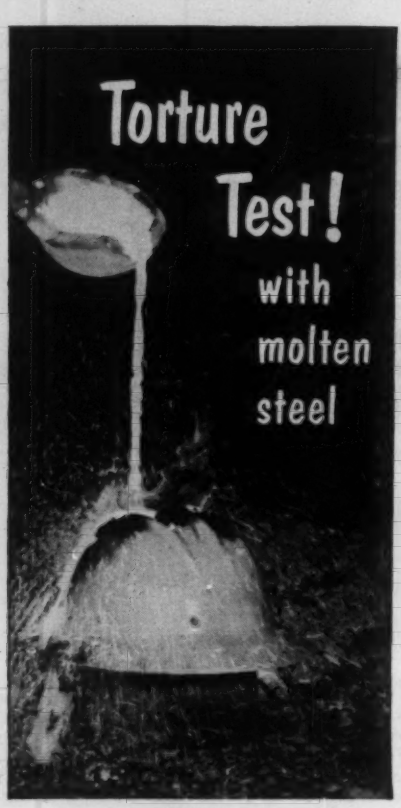
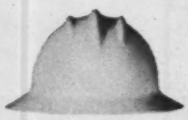


Steel, molten at 3000° F., was poured over a Bullard Fiberglas Safety Hat. The white hot metal did not pierce any part of the hat. Proof of the extra margin of safety built into all Bullard Fiberglas Hats and Caps.

Hat after test



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LOOPED SUBMARINE CABLES exposed on the mud flats at edge of Oso Bay at Corpus Christi during an extremely low tide.

Big Loops in Submarine Cable Lines Solve Problem Caused by Deep Mud

A mile-wide bay with a bottom of soft, deep mud presented an unusual problem to builders of a communications link between the big Naval Air Station at Corpus Christi, Texas, and a new radio transmitting center across Oso Bay. The shortest route for the big connecting cables lay across the shallow bay in which soft silt had an average depth of 110 ft with pockets believed to be as deep as 300 to 400 ft.

The local electric utility company had learned to its sorrow that poles would not stand up for any length of time in this mud. Hence the builders of the new communications link decided to use submarine cables. However, submarine cables of sufficient strength to meet the conditions found at this crossing would weigh 10 lb per foot of length, which meant that they would sink slowly in the soft mud of their own weight.

How deep the cables would sink or how long it would take them to reach a state of equilibrium could not be determined accurately because of the variable character of the soils in bay bottom and their varying depths. Dredging a trend to the depth to which the cables would settle of their own weight was out of the question.

To meet this situation, it was decided that the cables should be laid across the bay bottom in looped lines of sufficient length to provide for settlement of the cables to the bottom of the soft mud. Using the best available information as to the depth of the mud, a tentative final profile was computed and then the length of the loops required to lay that length across the bay was increased about 60 percent as a precautionary measure to reduce strain on the cable should settlement be rapid at any one point along the cable line.

Finally, 60 ft was added to the length of the cable to permit a reserve length of 30 ft to be coiled in a big anchor manhole at each end of the submarine line.

In each manhole, tension is applied to the cables by heavy springs attached to split cable grips with rawhide lacing. These grips will permit the 30 ft of reserve cable to be played out slowly when tension in the line due to unexpected settlement of either cable passes a predetermined amount.

Use of this reserve is not anticipated, but that arrangement has the advantage of simplifying the task of adding to the length of the submarine cable should periodic inspection of the manholes indicate that the computed amount of settlement was in error.

For placing the looped lines, the cables were floated out across the bay using auxiliary fuel tanks from airplane wings as floats.

This cable laying operation was done by the Paul Martin Electric Co. of Corpus Christi, under the direction of Paul Martin, owner, and M. W. Heft, chief engineer.

tt
TUBE-TURN

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NEW!

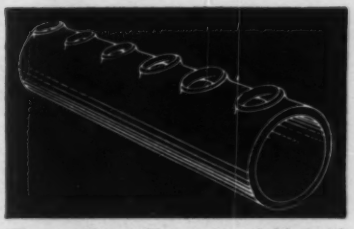
TUBE-TURN Manifold Welding Fitting

simplifies piping construction, reduces costs

TUBE TURNS now offers custom-made Manifold Welding Fittings with size, wall thickness, and number of outlets as required by your service conditions. These manifold fittings are available in all commercial metals and alloys.

Use of TUBE-TURN* Manifold Welding Fittings provides stronger and safer outlet connections than are possible when pads and saddles are employed. This new fitting makes possible greater economy and speed of construction in many types of service. It is particularly useful when outlets are smaller than one-half the run pipe diameter, when they are extremely close together, or when they must vary in size.

This new addition to Tube Turns' line enables you to "specify TUBE-TURN" for all your tee and manifold fitting requirements. For prompt, helpful service, get in touch with your Tube Turns' Distributor. You'll find one in every principal city.



The new TUBE-TURN Manifold Welding Fitting . . . superior to pad and saddle construction . . . easy to install . . . dependable in service.

TUBE-TURN Welding Fittings and Flanges are made in U.S.A.
They meet *all* U. S. piping code specifications

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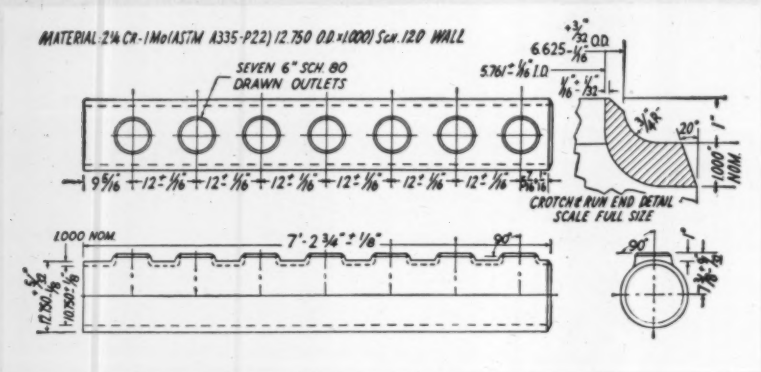
Why TUBE-TURN Manifold Welding Fittings give you safer service

In conventional pad and saddle construction, the transition to the side section of the branch is abrupt, creating stress concentration, often leading to failure. The TUBE-TURN* Manifold Welding Fitting with *integral extruded outlets,* is superior in strength. It provides a smooth transition from the pipe run to the smaller, thinner-walled outlets, and is thus better able to withstand cyclic stress from pressure or temperature changes.

TUBE-TURN Manifold Welding Fitting being installed in a measuring station of a large west coast gas utility.


MATERIAL: 2¼ CR-1 Mo (ASTM A335-P22) 12.750 O.D. x (.1000) Sch. 120 WALL
SEVEN 6" SCH. 80 DRAWN OUTLETS
6.625-1/16
5.761"±1/16 I.D.
20°
1" 1000" NOM.
CROTCH & RUN END DETAIL SCALE FULL SIZE
1000 NOM.
7'-2 3/4" ± 1/8"
90°

12" Manifold with Seven 6" Outlets. Schedule 80.

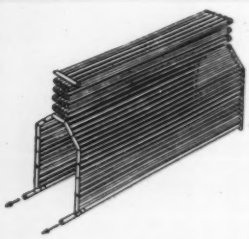
CODE APPROVED

TUBE-TURN Manifold Welding Fittings are in full accordance with the latest recommendations of ASA B31.1 Subcommittee No. 8.

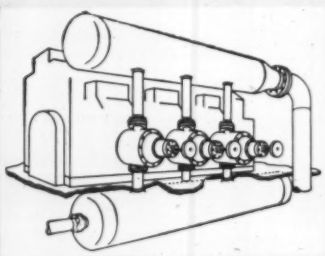
TUBE-TURN Manifold Welding Fittings comply with the requirements of ASA B16.9 and ASTM A234 covering the design and manufacture of butt welding fittings.

TYPICAL APPLICATIONS

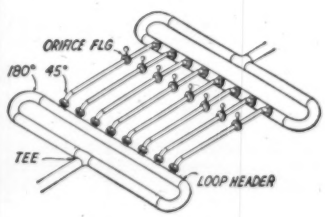
TUBE-TURN Manifold Welding Fittings can be used in virtually all types of major piping systems. Tube Turns' Sales Development Department will be glad to assist you in application problems.



Pipe Still or Charge Heater



Compressor Station Suction and Discharge Headers



Meter Run Loop Header

MANIFOLD DATA

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TUBE TURNS

A DIVISION OF NATIONAL CYLINDER GAS COMPANY
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Near Philadelphia:

New Bridges Span Delaware

Two major highway bridges—now in about equal stages of construction at sites 35 miles apart—will provide badly needed additional transport links between the thickly-populated community that stretches almost without a break along the Delaware River from Trenton, N. J., southward past Philadelphia to Wilmington, Del.

Biggest of the two—in size, cost, complexity of traffic connections—is the Delaware River Port Authority's $90 million suspension bridge between Packer Ave., Philadelphia, and Gloucester City, N. J., which is designed to relieve the enormous traffic pressure on the authority's existing Philadelphia-Camden structure. Its long approach road will gather traffic from a dozen major Philadelphia streets and parkways into a single route that will enable through traffic to bypass most of the city. Similarly, on the New Jersey side, approach lanes will provide better access to riverside industrial and residential areas, and better connections to highways leading to Jersey shore areas.

Thirty-five miles upriver, near the Pennsylvania hamlet of Edgely, the Pennsylvania and New Jersey Turnpike Commissions are jointly sponsoring a $15 million bridge to provide direct connections between their respective toll roads. Approaches from the Pennsylvania side are already built to within a half-mile of the bridge approach proper; contract for New Jersey approach roads were let recently.

• **Second bridge needed**—You need only a glance at a map of the vast sprawl of residential-industrial communities that line both banks of the Delaware around Philadelphia to realize the need for an additional river crossing. Provision also is needed for future traffic arteries. Pennsylvania, for instance, is now talking about a "Delaware Expressway" to cut through the heart of Philadelphia from the new bridge to the new turnpike connection at Edgely.

But you have to get on the ground to see the construction problems on a bridge that will have a 2,000-ft suspension span, with side spans 770 ft long, designed to carry a seven-lane roadway.

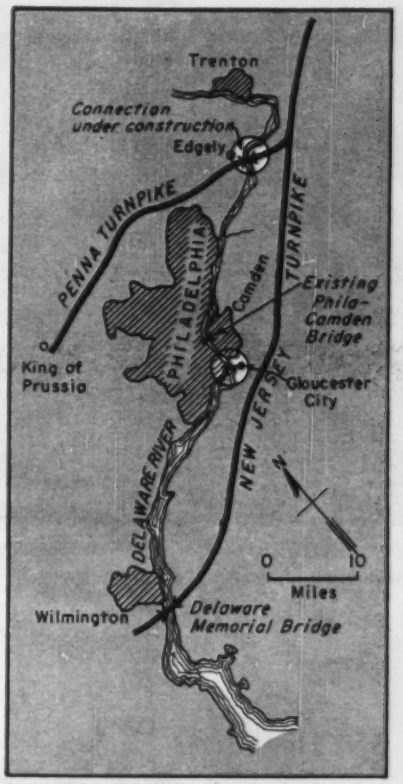
Right now, solutions to two of the most interesting of those problems are rapidly being covered over: The foundations for anchorages on both sides of the stream, and for the river piers. On the New Jersey side, the slim twin-legged tower has already reached its full 370 ft height, and Bethlehem Steel's erection crews are already at work on the Pennsylvania tower.

And the huge anchorage blocks are already well above ground, their forest of eye-bars being slowly encased as contractor Booth & Flinn proceeds methodically with the exacting job of placing concrete to its full height of 132 ft above ground level.

Fehlhaber Corp., of New York City, was awarded the contract for construction of the two river piers; Merritt-Chapman & Scott for anchorage foundations.

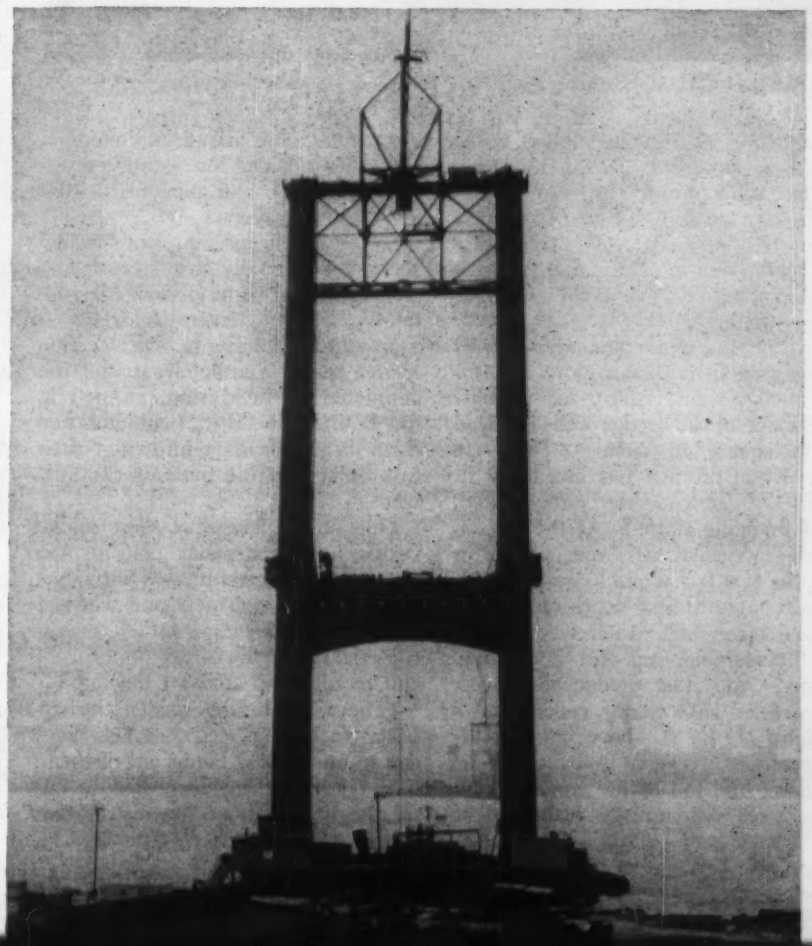
They chose a dredged caisson for the river piers, an open cofferdam for anchorages.

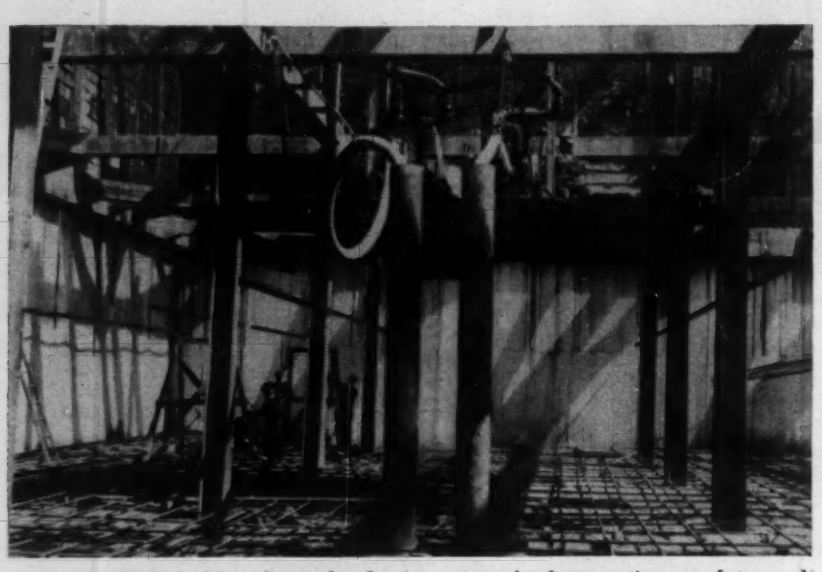
• **Dredged caisson**—Fehlhaber—working to designs prepared by Moran, Proctor, Mueser & Rutledge, consulting engineers—began by removing the silt to firm bottom and dredging up sand islands, (on the Philadelphia side) behind cellular sheetpiling, en-



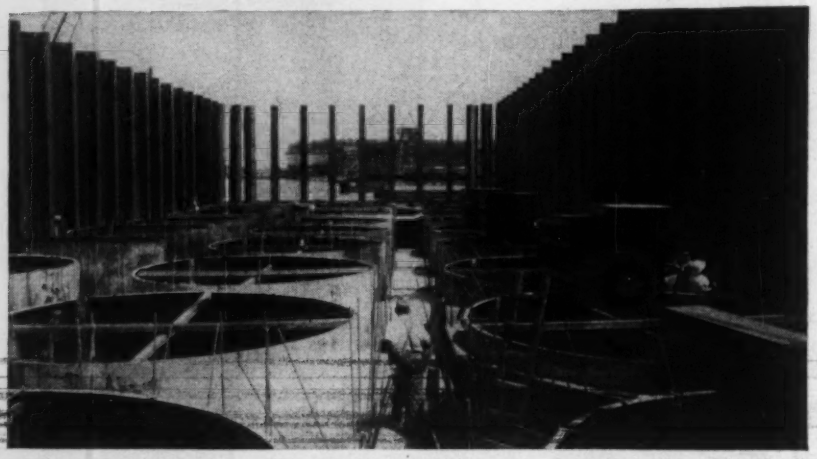
35 MILES APART two new bridges (circles) across the Delaware will help ease traffic problems for intercity and cross-country motorists and commercial traffic.

TWIN SHAFTS of New Jersey tower of Philadelphia-Gloucester City bridge are now topped out with cable saddles. Erection of Philadelphia tower has started as derrick boat (visible between shaft legs) starts steelwork. Crawler will complete erection.





OPEN COFFERDAM with wooden lagging except for bottom tier served to reach firm footing for anchor block foundations.



DREDGED CAISSON (this one on New Jersey side) founds river piers.

compassing an area 200x300 ft. (On the New Jersey side, the "island" was in fact a fill outward into the stream from the bulkhead of an abandoned shipway on the site.)

On top of the sand island, the contractor assembled the welded cutting edges to the full 174 x 64 ft dimensions of the pier foundations with cross walls in both directions to form 27 dredge wells. Above the first lift the shape of the dredge wells changed from square to circular, 15'-4" in dia. Then the first two lifts of 13 ft. and 4'-9" of concrete, were poured, and dredging started. As the caisson sank, successive lifts were added (in depths of 4 ft 9 in. each) two or three at a time, until final depth of 107.6 ft below mean high water was reached at Philadelphia, and 76.1 ft at Gloucester City. The dredge wells were then filled with tremie concrete to a height of 15 ft above the cutting edges.

Since the top of the concrete caisson itself was sunk 22 ft below the top of the sand island, a cofferdam had to be provided for casting the distribution block and pier shafts that rest atop the caisson.

So, when the caisson had reached a point where only two lifts of concrete remained to be placed, the contractor cast a series of openings at 6 ft centers, for 30 in. WF-section soldier beams completely around the perimeter of the caisson, grouted in the beams (see illustration) and tied them heavily with reinforcing, then cast them into the mass of the final lift.

Outside the flanges of these soldier beams, he placed panels of 6 in. and 4 in. timber, precompressed with steel bands for watertightness, and achieved a cofferdam that was in effect cantilevered out of the caisson block itself and required no cross-lot bracing.

(The soldier beams, incidentally happened to be so placed that Fehlhaber got an unexpected bonus out of them. The contractor had expected to cut off the beams above the distribution block and remove them. But the authority found them to be in such position as to serve as the support for the pier fender system, and so purchased the end and off shore beams and kept them in place.)

• **Open cofferdam**—Merritt-Chapman & Scott, on the other hand, used open cofferdams 124 ft x 144 ft for the riverward portions of the anchorage foundations.

Six deep wells were put down, each pumping about 500 gpm, which lowered the water table. Apparently, there was little or no relationship between the river water and water pumped by the wells.

Then a series of heavy spud piles was driven down the center of the proposed excavation to act as supports for cross-bracing, and steel soldier beams at 6 ft centers were driven around the perimeter to a depth of −80, on the Phila. side and −62 on the Gloucester side, 10 ft below the planned depths of the cofferdams. Horizontal louvered wood sheeting was placed behind the flanges of the soldier beams as the excavation went down. The open sheeting relieved hydrostatic pressure behind it so that the bracing had only to support earth loads.

Chief among the problems of such a system, according to H. E. Pagliaro, MC&S project superintendent, lay in driving the soldier beams as nearly vertical as possible in order to remain within a tolerance of less than 6 in. between top and bottom of the cofferdam. This simplified the bracing system by minimizing the need for fillers.

Authority engineers were happy with the open cofferdam method, among other reasons, because it made possible examination of soil conditions in the dry. They are able, for example, to permit pouring the base slab on the Phila side at −60 (instead of the planned −70) because soil conditions were found favorable.

MC&S made use of its big floating batch plant (capable of pumping up to 110 cu yd an hour) to cast 33,320 cu yd that went into the Philadelphia achorage, and 29,920 cu yd for the Gloucester anchorage. (The rig then moved upriver to work on the turnpike bridge, where MC&S has the complete foundation contract.)

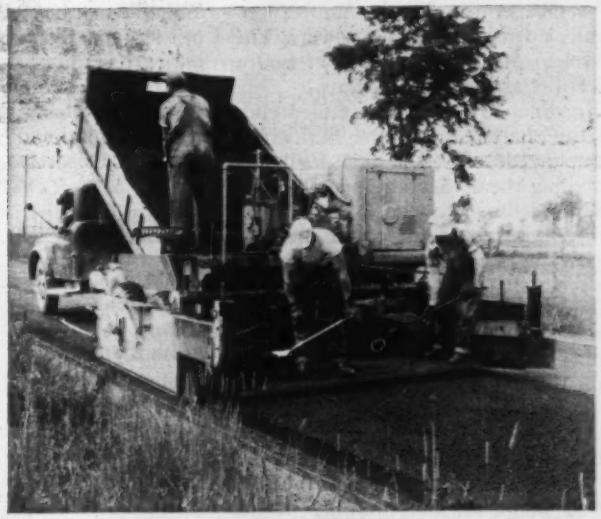
• **Towers go up**—Bethlehem Steel's crews, under G. P. Bullard, manager of erection, began work first on the New Jersey side (steelwork started on the Pennsylvania side the first week in April).

First job was to build a steel-supported work platform completely around the pier shafts; next was to move into position what is said to be

JAEGER offers these better "tools" for paving

LAYING UP-HILL ON A DOWN-GRADE CURVE: On this section of the Hollywood Freeway, outside Los Angeles, J. E. Haddock, Ltd. laid six 12 ft. lanes of divided roadway of 8″ uniform thickness at a steady average of 100 cu. yds. (337.5 lin. ft.) per hour. With ordinary finishing equipment, working down-grade on this curve would have entailed considerable hand labor carrying back and finishing to the high side of the slab. But with the Jaeger Type "X" finisher it was only necessary to set the diagonally rear screed at proper angle to keep material working up-hill and compact it solidly against the higher form.

SPREADER WORKS CLOSE TO PAVER: The job of finishing on the Hollywood Freeway was made much easier by this Jaeger screw spreader which remixed and spread the material as it came from the paver, struck off to grade and vibrated both edges of the slab. Continuous strike-off close behind the paver makes it simple to regulate the amount of concrete provided for final finishing. For maximum accuracy on high production work, the Jaeger spreader can be furnished with oscillating material screed — an exclusive advantage.



DUAL DUTY SPREADING SAVES COST: The United Counties are three Ontario counties that pooled their limited maintenance funds to stretch them farther. A typical cost-saving is their use of one inexpensive Jaeger aggregate spreader to lay both base of broken stone and 3″ top of hot mix. Job shown is on 4.5 miles of County Road No. 5 in Matilda Township, laid in two 9 ft. lanes at average rate of 1800 lin. ft. per day. Workmen on tail platform are scattering loose material on top surface to improve its skid resistance.

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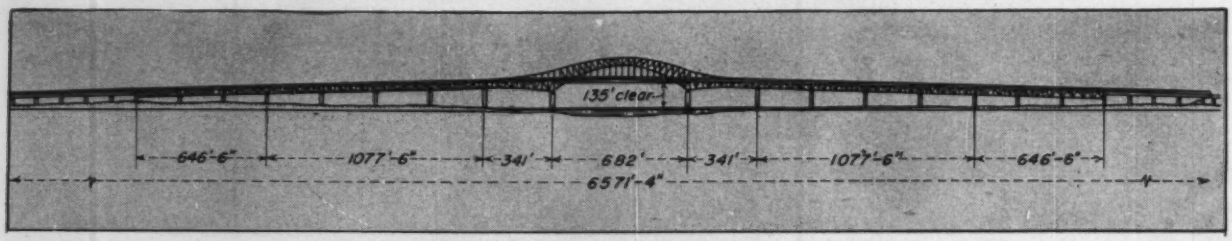


TURNPIKE BRIDGE will be symmetrical truss structure, connecting New Jersey and Pennsylvania 'pikes for through traffic.

one of the world's largest tower derrick boats for erection of the first three tiers of the tower legs. (This derrick boat carries a 100 ft boom with a 20 ft extension, so that, with the tower, the tip of the boom stands 240 ft above the water. It can lift a capacity load of 115 tons.)

Each main tower consists of two 370-ft-high hollow steel shafts made up of 10 tiers of cellular sections, varying from 22 x 16 ft at the base to 12 x 14 ft at the top. The shafts are connected below the deck and at the top with arched portal struts. Tiers 2 thru 9 are made up of four small oblong units. Tier 10—where the top strut connects, the two shafts—contains six units each.

Because of the distance between the two tower legs (87 ft apart at the base) the steel erector elected to finish erection above the third tier by means of a creeper traveler that moves vertically up the face of the towers. The traveler carries a 95 ft boom and a 20 ft jib, and can lift 65 tons.

In order to protect the milled ends of the shaft sections, the Bethlehem company developed a steel cradle for handling them. Sections arrive loaded flat on railroad cars, delivered by car ferry. The traveler lifts the sections from the cars, placing them on the working platform with one end resting in the cradle. The hitch plates are then shifted to connections at the upper end of the section and the section tilted upright as the cradle rocks.

• **Approaches under way**—While erection of the main towers of the bridge is being pushed, and preparations are being made for the spinning of the two 23-in. cables that will support the bridge roadway, contractors on each side of the river, are pushing work on connecting highways.

This work will include construction of several entirely new roads on the New Jersey side, and the long and elaborate approach sections in Pennsylvania. Byproducts will be rehabilitation of considerable areas on both sides of the river.

Consulting engineers for the Port Authority responsible for the design and supervision of construction are the firms of Modjeski & Masters and Ammann & Whitney functioning jointly. Homer R. Seely is project engineer for the consulting firms. Harbeson, Hough, Livingston and Larson of Philadelphia are the consulting architects. All construction work is under the direction of the Port Authority staff.

• **The Turnpike Bridge**—At Edgely, engineers and contractors for the two turnpike commissions had no such problems as at Philadelphia, in regard to setting a bridge in a built up, heavily industrialized community.

On the Burlington County (New Jersey) shore of the river there is virgin woodland and farms; and on the Pennsylvania side, although U. S. Steel's huge Morrisville plant is only a few miles away, only five relatively small private residences had to be removed from the bridge's path. (But one main highway—U. S. Route 13—and the six-track electrified main line of the Pennsylvania Railroad and some local streets must be crossed.

The new bridge linking the two turnpikes is to carry a six-lane roadway having a total width of 67 ft. And as the War Department required a clearance of 135 ft above mean high water, the structure will have a total length of 6,571 ft. The main span will be 682 ft long and the side spans 341 ft.

The first ten reinforced concrete piers on the Pennsylvania side, and the first four on the New Jersey side are twin shafts that will carry simple plate girder spans. Between these two points, however, the bridge will be a symmetrical truss structure, with three-span and four-span continuous deck trusses on either side, meeting at the three-span main truss over the water.

The superstructure—all under contract to American Bridge Division of U. S. Steel—will be erected by crawler cranes, except the main three-span unit river crossing which will be built as cantilevers. Since the center span will be arched, carrying the roadway by suspenders, it will give the appearance of a tied arch, although the deck will be discontinuous with a joint at the center.

• **Substructure**—Moving its floating batching plant and other equipment up from the Philadelphia-Gloucester

Who's Building Philadelphia-Gloucester Bridge

Fehlhaber Corp., New York	Two river piers	$3,244,620
Merritt-Chapman & Scott Corp, N. Y.	Anchorage foundations	3,316,670
Booth & Flinn Co.	Anchorage superstructure	3,647,075
Bethlehem Steel Co.	Towers and cable anchorage metalwork	6,610,070
American Bridge Division, U.S. Steel Co.	Cables & suspenders	4,768,293
Bethlehem Steel Co.	Suspended structure, decks on anchorage	7,666,263
American Dredging Co.	Grading, Philadelphia	1,346,310
Conduit & Foundation Corp.	Viaduct substructure, Philadelphia	1,964,678
Bethlehem Steel Co.	Viaduct superstructure, Philadelphia	6,977,681
H. J. Elkin, Inc., and Van Wyck Construction Co.	Truss span substructure, New Jersey	650,161
Bethlehem Steel Co.	Truss span superstructure, New Jersey	3,347,344
Union Building & Const. Corp.	Stringer spans substructure, New Jersey	1,543,025
Not yet awarded	Stringer spans superstructure, New Jersey	
Not yet awarded	Electrical	

Other contractors on approach sections are Geo. M. Brewster and Son Inc. on the New Jersey side and Perry S. Goldman Const. Co. and Laub Const. Co. Inc. on the Philadelphia side.

1949 Within 48 hours after pouring this concrete, the section was open for all traffic.

1955 The same section after more than 5 years of relentless beating shows no evidence of wear.

Owner: Port of New York Authority

Contractors: Moser Contracting Co. Inc. Long Island City, N.Y.

Ready Mixed Concrete: Metropolitan Sand & Gravel Corp., New York City

LEHIGH EARLY STRENGTH AIR-ENTRAINING CEMENT

solved a problem of

TIME and TRAFFIC!

In 1949 several badly worn sections of pavement on the George Washington Bridge had to be replaced. To do the job with minimum inconvenience to the public called for good management, fast work . . . and a quick curing concrete that could take the pounding of heavy traffic in the shortest possible time.

Using Lehigh Early Strength Air-Entraining Cement, and a vacuum curing process, the contractor opened sections to all traffic within 48 hours after pouring concrete. During the entire job, bridge traffic moved without interruption. Today, after more than five years, these new sections show no evidence of wear—despite the daily drubbing from 90,000 vehicles.

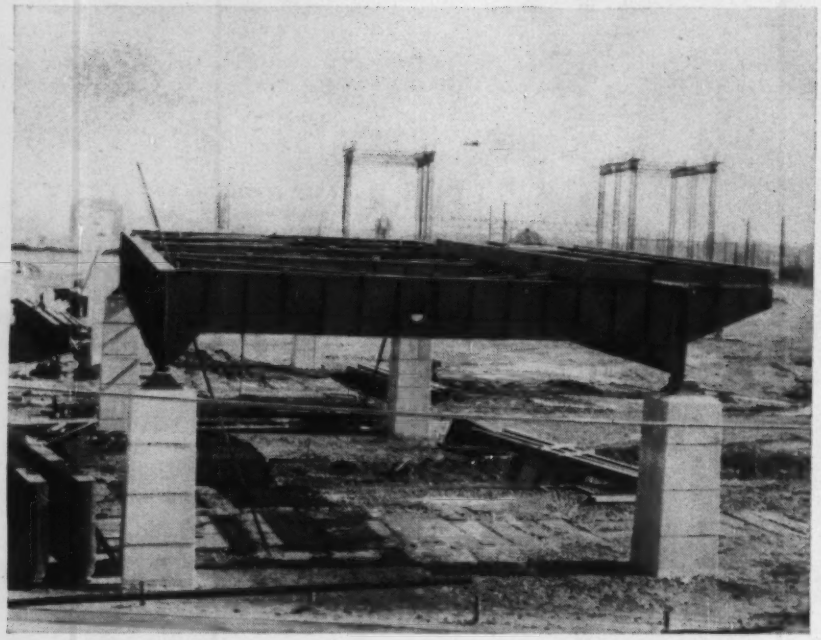
That's construction speed and durability, the combination you get with Lehigh Early Strength Air-Entraining Cement. A name to remember when your problem is time and traffic.

LEHIGH

PORTLAND CEMENT COMPANY

Allentown, Pa.

- **Lehigh Early Strength Cement**
- **Lehigh Air-Entraining Cements**
- **Lehigh Portland Cement**
- **Lehigh Mortar Cement**



APPROACHES to turnpike bridge include simple girder beams, cantilevered on either side to provide full 67-ft roadway.

PIERS are reinforced concrete, the four nearest the river being cast by pumping from floating batch plant. Formwork for connecting truss is supported on steel girders, resting on stubs cast into inside walls of legs.

City job, again under Mr. Pagliaro, Merritt-Chapman & Scott set to work on its $3.7 million contract, covering all substructure.

Simultaneous problems immediately were the two river piers, well out in the stream, and the piers on either side of the stream, at the water's edge.

The river piers foundations were solved in a conventional way with sheetpile cofferdams and tremie seal over foundation pile clusters; but in a way they are reminiscent of MC&S' procedure at Philadelphia.

A total of 496 steel H-piles were driven into the river to a point 50 ft below the bed of the stream, into weathered gneiss formations, to a bearing of 100 tons or more.

After locating the foundation site exactly, the contractor drove 12 10-in. H beam spud piles down the center of the planned 53 x 159 ft cofferdam, to support the bracing system. The bracing system was then prefabricated on shore in sections equal to half the cofferdam area, floated out to position, and lifted by floating cranes to fit over the spud piles, and locked into place with soldier piles.

Using the walers of the bracing system as guides, sheetpiling was placed around the entire perimeter, then driven into the river bottom.

Then the enclosed area was clamshelled to grade, jetted to clear pockets, and 2,000 yards of tremie concrete (6 ft thick) put in place to form a foundation mat. The cofferdam was then unwatered, and concreting operations are now proceeding. The heavy granite blocks, which will form the face of the pier, are being used for forms in a zone running from 11 ft below mean tide to the tower base. Two courses of the blocks are put in place (about 5 ft high, held with wedges and tiewires) and then concrete poured inside.

The two piers on the river banks also were designed to be supported on piles, and it was thought that foundation work would also have to be done behind cofferdams. But MC&S decided that the heavy, clayey sand that forms the river bank would make a fine cofferdam in itself—and proceeded to bulldoze two dikes into the stream bed. Pumps kept the excavations dry and pile driving and casting of concrete went ahead in the dry.

These two piers, incidentally, are the highest on the job—103 ft above mean high water. MC&S pumped concrete for the entire height of the piers, plans to do so for the river piers which are about 85 ft above mean high water. All other piers will be cast by buckets from mixer trucks.

All other piers stand on spread footings, except east abutment, which is supported by 120 battered 12 in. x 53 ft H piles.

Because of a desire to have the bridge present a symmetrical appearance, the piers present a problem in formwork and placement of reinforcement for the builders.

To provide support for forms for the spandrels, stub beams are cast into the final pour of the shafts themselves. Then (see illustration) built-up steel girders, shaped to the bottom of the finished spandrel, are placed atop the stub beams, and the formwork built on top.

After the spandrel has set and formwork is stripped, the girders are removed, stub beams burned off and sealed flush with the concrete.

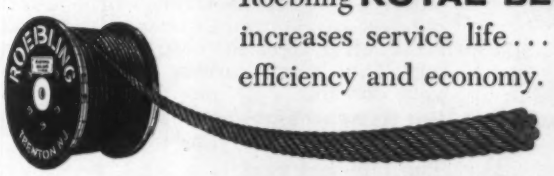
George S. Richardson, consulting engineer, Pittsburgh, is general consultant to the turnpike commissions on the bridge work, with George F. Nechwort as project engineer on the job. Associated with Richardson are Moran, Proctor, Mueser and Rutledge of New York, consultants on foundations. Harbeson, Hough, Livingston and Larson of Philadelphia are architects.

NOW! SLASH WIRE ROPE COSTS WITH ROEBLING'S NEW

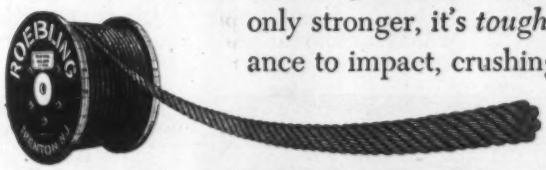
Royal 1105 Blue

15% STRONGER THAN YESTERDAY'S STANDARD

MADE OF ROEBLING'S NEW TYPE 1105 WIRE—the finest rope wire—Roebling **ROYAL BLUE** Wire Rope is guaranteed to be 15% stronger than standard wire ropes of the same size and construction.



Roebling **ROYAL BLUE** Wire Rope vastly increases service life . . . brings unprecedented efficiency and economy.



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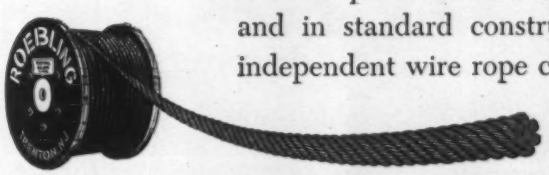

You'll soon be able to get **ROYAL BLUE** Wire Rope in all diameters from ¼" to 3½" and in standard constructions employing an independent wire rope core.

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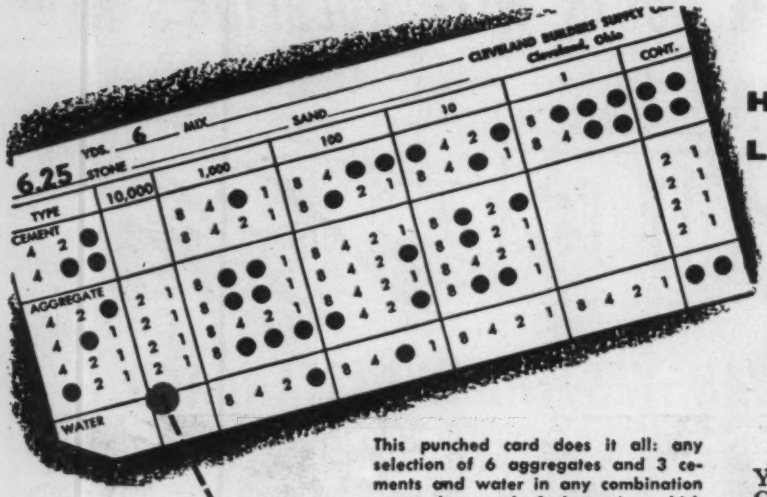


This punched card does it all: any selection of 6 aggregates and 3 cements and water in any combination — at the speed of electronics, which is 186,000 miles per second.

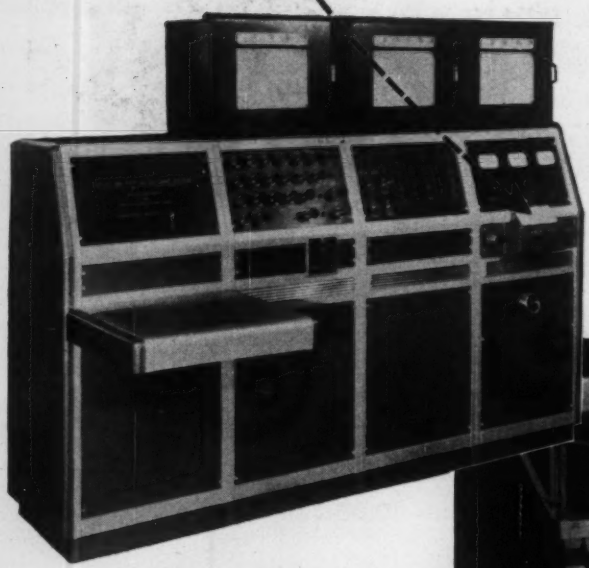
HAVE YOU LOOKED INTO THE BUTLER XK-1 Punched Card Electronic Batcher?

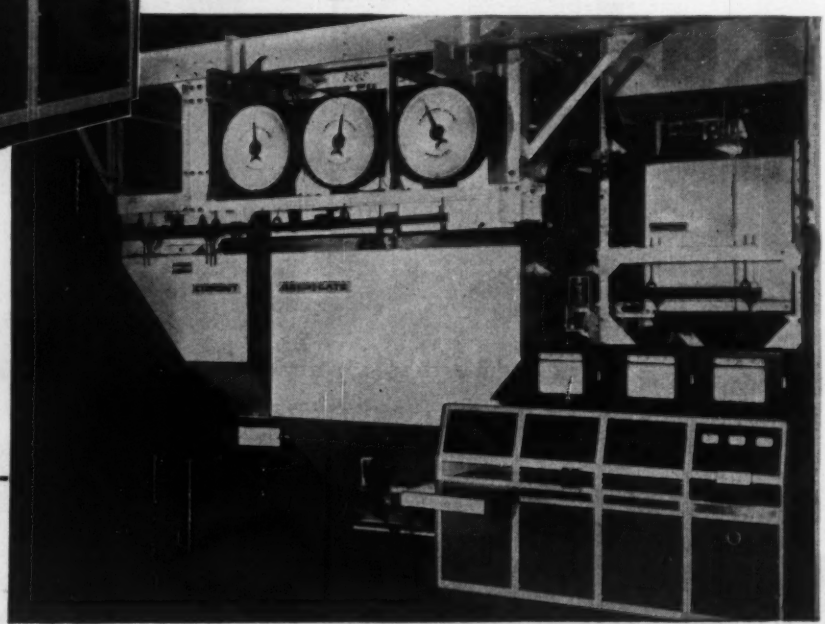
You should, because BUTLER Punched Card Batching is changing production-planning in the Ready-Mixed Concrete Industry. BUTLER Punched Card Batching is of *immediate* importance, for the equipment *can be installed on any existing Ready Mixed Plant* — no matter who the manufacturer.

And the BUTLER XK-1 is of *immediate* importance because of absolute quality-control. The Ready Mixed operator who converts to BUTLER Punched Card Batching has an enormous competitive advantage. The BUTLER XK-1 takes the costly human element out of batching. That alone carries a powerful selling impact for *your* concrete.

But just as important is the cost-saving *simplification* of paper work for your organization.

The punched card is a legal, permanent, finger-tip file-record which can be re-used tomorrow or a year from now. Invoices can be typed from the card — or with auxiliary bookkeeping, equipment, accounting can be wholly automatic. And your dispatcher can also be your batcher.





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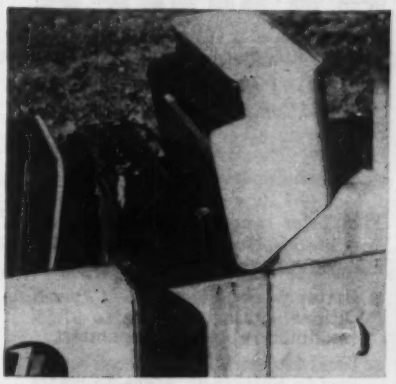
STEEL PADS transfer digging loads to ground not axles. Underslung boom arms and rams can never trap careless operator's arm.

"Pry-Out" Puts Bigger Payloads in Payloaders

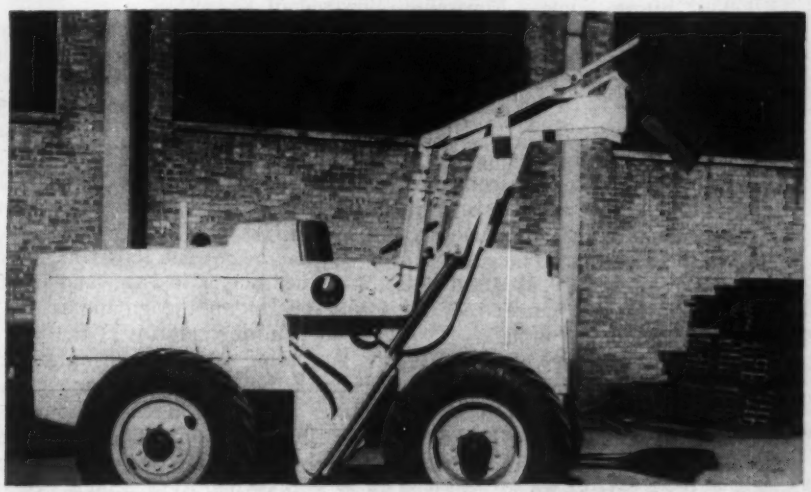
An "old-as-the-hills" digging principle (pry-out action) that's radically new on tractor-shovels plus 40 deg of bucket rollback at ground level—that's the story of two new Hough Payloaders. But it's only half the story until you see them get bigger payloads faster and, more important, keep 'em.

The digging principle is based on the fact that you can apply more power safely if you use the ground as a fulcrum rather than absorb opposing load forces in axles, tires or the hydraulic system. To do this, the new Houghs employ steel breakout pads that rest on the ground when the bucket is thrust into the bank. As the bucket is tilted back—and on the Houghs it goes way back—the resistance to movement is transferred to the pads and thus to the ground. The 40-deg rollback at ground level means the operator can pick up bigger loads faster; the pry-out action means that he can do this with less strain—and, logically, less wear—on the machine.

As a matter of fact, "Dennis the Menace" operators are going to be mightly frustrated if they try to break up these new Payloaders—they're de-



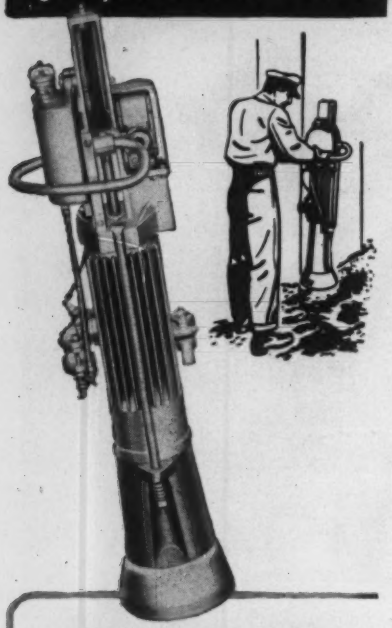
EASILY ACCESSIBLE battery box and hydraulic oil reservoir are behind seat.



SMALLER MODEL HU employs same principle as the larger HH shown above. Pry-out action and 40-deg bucket rollback are features on both of the new Payloaders.

STEEL PADS on the HU are smaller but just as effective as the HH's larger ones.

For the LOW BID on any job, figure your costs with BARCO



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SOIL COMPACTION is here to stay! *Specified Compaction* is now accepted practice on all modern construction projects. The BARCO RAMMER gives you specified compaction on these jobs at very little extra cost. Time after time, it has been proven that no other type of equipment can match BARCO PERFORMANCE:

- Better work! Easy to meet specifications calling for 95% to 97.5% (modified Proctor) compaction.
- Ideal for work in restricted areas: inside buildings, close to walls, culverts, and abutments — in trenches, ditches.
- Faster compaction! 20 to 30 cu. yds. per hour — day in and day out.
- One man operation! Completely self contained; no auxiliaries needed.
- Low operating cost. Low initial cost.
- SAFE! Simple to operate. Operators like Barco Rammers.

ASK FOR A DEMONSTRATION — See for yourself — ask for our nearest distributor to give you a demonstration.

BARCO MFG. CO.
514G Hough Street
Barrington, Illinois

Ask for Catalog 621

signed for a heavy foot and a heavy hand. When there's gumbo in the bucket and the gobs have got to go, the operator can slam the bucket sharply without damage to the hydraulic rams; special steel stops prevent it.

Further, the machines are designed to carry loads low and close to the machine for less spillage and greater stability. According to the company, the new models have greater stability when loaded than when they are empty.

Hough designers have even tried to keep the operator from breaking up himself. The underslung boom arms and hydraulic rams never get within the area where they might trap an unwary operator's arm. The need for safety guards or screens has been eliminated with the added bonus of increased visibility.

Less spectacular perhaps, but almost as important, the comfort of the operator has also been considered. Molded foam-rubber seat and back cushions on a one-piece frame combined with adjustability of the seat make the Payloader cockpit a fairly comfortable place to work—and there's plenty of legroom too. The long wheelbase on the units also tend to smooth out the ride.

Both models are equipped with torque converters and full reversing transmissions. Hydraulic brakes and power steering are standard and load-shock accumulator devices are optional. A choice of gasoline or diesel engine power is offered with the gas powered units operating on 12-v battery systems.

The Model HH is the larger of the two new machines. It has a struck capacity of 1½ cu yds and a heaped capacity of 1¾ yds. The 6½-ft wide bucket has a 10,000-lb breakout force and an 11,000-lb lifting force. Maximum dumping height and clearance is 9 ft with maximum angle of dump 50 deg. It takes 7½ sec to lift the bucket and 5 sec to lower it.

The HH is powered by a 100-hp gasoline or 92-hp diesel. Since it is equipped with a torque converter, there is an infinite number of speeds in each gear range both forward and reverse. In the four forward ranges, maximum speeds are 2.6, 4.9, 10.4 and 20.0 mph. In the reverse ranges they are 4.0, 7.7, 16.1 and 31.1 mph.

Weight of the diesel powered HH is 15,800 lb; the gasoline powered unit is 400 lb lighter. Overall height is 6 ft 8¾ in. Length with the bucket on the ground is 16 ft 11½ in. and maximum width is 7 ft 5¾ in. Wheel base is 7 ft ¾ in.

The smaller, Model HU has a cu yd heaped capacity, ¾ cu yd struck. The bucket is the same width as on the HH—6½ ft—but has a breakout force and lifting capacity of 8,000 lb. Maximum dumping height and clearance is 8 ft and maximum dumping angle is 47 deg. It can be raised in 7 sec and lowered in 5 sec.

The HU is powered by either a gasoline or diesel engine, both rated at 84 hp at governed speed. Maximum speeds in the forward ranges are 2.4, 4.7, 9.7 and 18.7 mph. In reverse, the ranges are 3.7, 7.3, 15.1 and 29.2 mph. The diesel unit weighs 13,000 lb—340 lb more than the gasoline powered HU.

Overall height is 6 ft 10¼ in., maximum width is 7 ft 2 in., and length with bucket on the ground is 16 ft 2½ in. Turning radius is 21 ft.

According to the manufacturer, both of the models have more horsepower and weight in relation to bucket capacity than competitive rubber-tired models. THE FRANK G. HOUGH CO., 772 SUNNYSIDE AVE., LIBERTYVILLE, ILL.

(*New Products continued on page 62*)

Folded Forms Store Easily And Are Economical to Use

A new unit for concrete forming is available in two designs—one for forming piers, short columns, window well drains, porch and fence post bases, etc., and another for forming column footings or pads. The new units, called Deltaforms, are light in weight and easy to handle, and they can save considerable time on a job since they eliminate the necessity of making forms for each individual use. One man can carry as many as 25 Deltaforms at one time, and all that is required to use them is to open the unit and start pouring. Delta Co., 333 W. 24th Pl., Chicago, Ill.

D. W. WINKELMAN CO. praises D Tournapull clean-up ability

Works 7-yard "D's" behind fleet of 9 C Tournapulls on 6.6 mile, $7,278,000 section of NYS Thruway

To help move more than 1,800,000 cubic yards of clay, gumbo, gravel, loam and sand on 3 New York Thruway contracts near Syracuse, D. W. Winkelman Co., Inc., brought in 10 electric-control Tournapulls and a rubber-tired Tournatractor . . . added them to their fleet of bottom-dumps, shovels, and crawlers.

Clearing rocks after paving, "D" triples output of front-end loader

To pick up scattered accumulation of rocks and smaller debris following paving and shoulder grading of the Liverpool Interchange, Winkelman called on a D Tournapull and a motor grader. The grader first windrowed all rock to the center of the completed slab. Then the Tournapull operator came along at 20 to 25 mph, lowered his blade to "float" on the roadway, and scooped up the stones. With this speed, he picked up 100' to 150' of windrow per pass. Rocks wouldn't boil, so there would have been no use trying for bigger loads by push-loading. Even without pushing, the company called this the cheapest method they knew of to handle the material. The Tournapull, they reported, picked up about 3 times as many rocks in a day as could a front-end loader. Tournapull's low-pressure tires rolled over both newly-set concrete and soft shoulders without causing damage.

The company was particularly pleased with the performance of their D Tournapulls used mainly for scattered clean-up behind both scrapers and bottom-dumps. These machines, Winkelman officials explained, proved ideal for the small-yardage sections of their big job. D Tournapulls also have ample capacity and speed to work profitably with the bigger machines in pusher fleets. They travel under their own power between all jobs at speeds up to 28 mph.

For example, on Winkelman's contract for dirtmoving at Liverpool (near Syracuse), the 7-yd. "D" shown helped regrade approaches on a park entrance road underpassing the Thruway. Unit self-loaded dirt from center of road and spread along the shoulders over widely varying cycles. It also bladed the shoulders, sloped banks, filled around culverts, etc. Job was finished in 1 day.

At other times, the versatile "D" removed excess gravel and fine-graded between paving forms . . . spread topsoil on shoulders and backslopes . . . cleaned accumulated boulders off roadway . . . and, with its extremely short turning radius (12'8"), did a variety of other clean-up, finishing and backfilling jobs where larger units would not have been economical.

"The 'D' is one of the handiest machines ever made for clean-up work," reported the grade superintendent.

It will pay you to investigate Tournapulls. You'll find a size to fit your needs. Call us for details on price . . . performance . . . and delivery.

Tournapull—Trademark Reg. U.S. Pat. Off., Tournatractor—Trademark PDP-604-H-b

LeTourneau-Westinghouse Company
PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

LENKER L-E-VATION ROD

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Lenker L-E-Vation Rod eliminates all calculations . . . a direct reading level rod for Engineers, Contractors, Builders . . . incorporates all the uses for which an ordinary level rod is adaptable. Simple and easy to operate, it is widely used.

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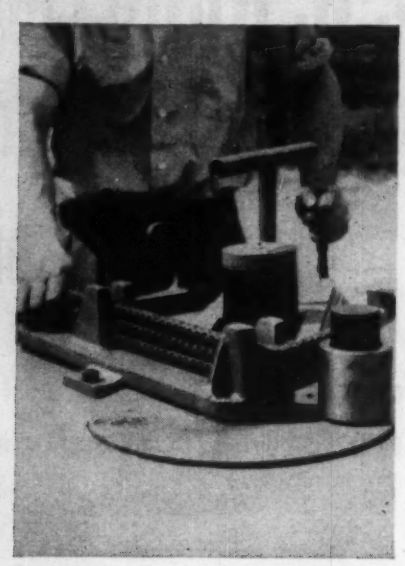
HOOK BENDING attachment handles large diameter bar or several smaller ones.



STIRRUP BENDING attachment can handle small bars, bend in two directions.

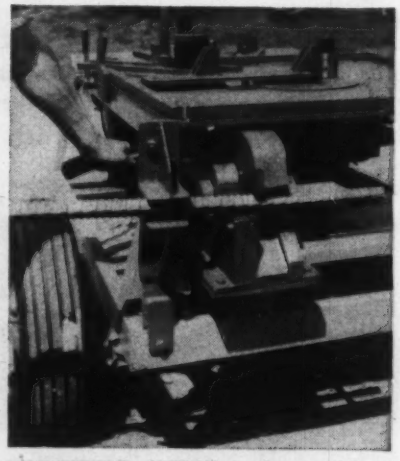
Rods Bent at Site

Hydraulic power replaces the ironworker's muscles

A hydraulically-operated rig promises to boost production and ease the ironworker's lot when it comes to bending or shearing reinforcing steel.

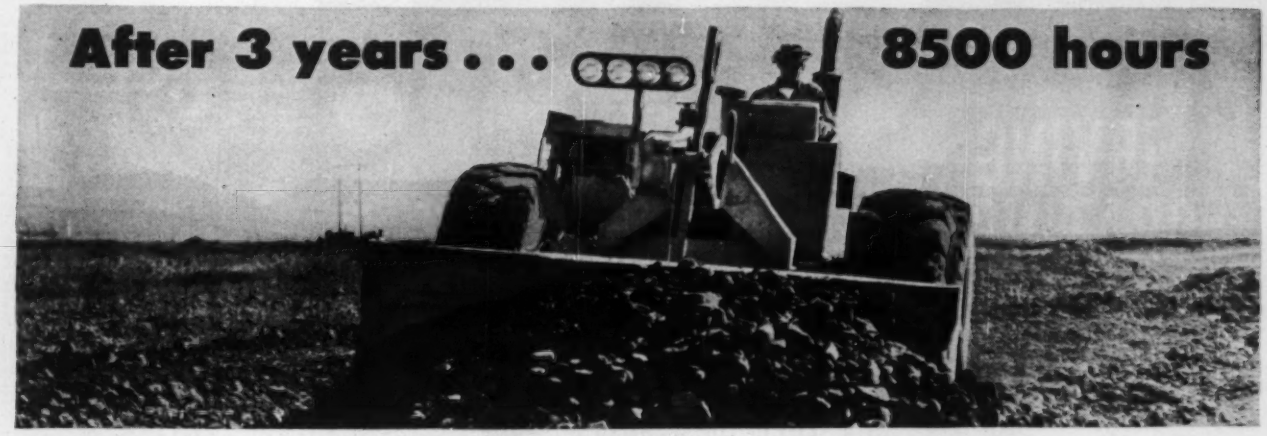
Called the Ironmaster, the machine consists of a turntable-type bending device and a shear for cutting the rods; both are powered by hydraulic rams. Together with a hydraulic pump and an engine or motor, the bender and shear are mounted on a two wheeled trailer that can be towed behind a car or truck or moved short distances by one man.

(*Continued on page 64*)



POWERFUL SHEAR is also capable of handling four ¾-in. dia bars at one time.

CHANGEOVER from stirrup bending to hook bend requires only very simple tools.



Dozing river-bottom rock and gravel within reach of dragline, Tournatractor moves up to 2½ cubic yards per push. Material, hauled by truck to crusher, will ultimately be used as finished aggregate on a new section of U.S. Highway 99E, south of Chico.

Mechanical efficiency 95%

1 original tire still working

How many hours' service do you get from a set of tracks?

Whatever the figure, take a look at the record of a Tournatractor owned by Richter Brothers, Oroville, California.

Their machine is about 3 years old. Three of its original tires were replaced at about 7,000 hours. The fourth is still going strong at 8,520 hours! (See right front tire in above photo.)

Remember, too, that Tournatractor's 19 mph speed enables it to cover 2 to 3 times as much ground as your crawler would in the same number of hours.

Richter Brothers have given their versatile Tournatractor the toughest kind of jobs, too.

On levee job near Corcoran, Tournatractor push-loads electric-control C Tournapulls with 11 pay yards of heavy, wet, lake-bottom gumbo in 30 seconds.

Tire wear small, even in rock

One recent assignment, for example, involved feeding river-bottom rock, sand, and gravel to a dragline. Here, Tournatractor pushed enough material to the loader to maintain production rate of 700 cu. yds. per 7-hour shift. In spare time, it maintained truck haul road. The abrasive and rocky material had little effect on Tournatractor. Its big low-pressure tires rolled *over* the grit instead of grinding *through* it.

On another assignment, Tournatractor helped 4 Tournapulls move 127,500 yds. of lake-bottom gumbo in 35 days for a levee at Corcoran, Calif.

Averages 15 mph job-to-job

Tournatractor also recently leveled 500 acres of farm land and did such highway construction work as push-loading scrapers, dozing, and pulling compactors. All job-to-job moves were made under rig's own power . . . a typical trip, Corcoran to Oroville, Calif. (300 miles), took only 20 hours. In 3 years, the machine has been 95% mechanically efficient, according to the owner. Says William C. Richter, owner also of 7 Tournapulls, "We have very little downtime with LeTourneau-Westinghouse equipment."

Says Operator Earl Sheppard, "I like Tournatractor especially well for dozing, clean-up work, and push-loading. It's fast and easy to operate."

Ask us to show you and your operators what these advantages can mean on your job. Call to arrange a demonstration.

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

Tournapull—Trademark Reg. U.S. Pat. Off.
Tournatractor—Trademark T-661-S-bw

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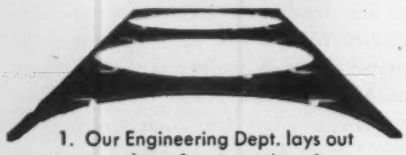
BECAUSE THEY FIT PERFECTLY!



1. Our Engineering Dept. lays out complete flooring plan from your floor plan, sketch or overall dimensions.
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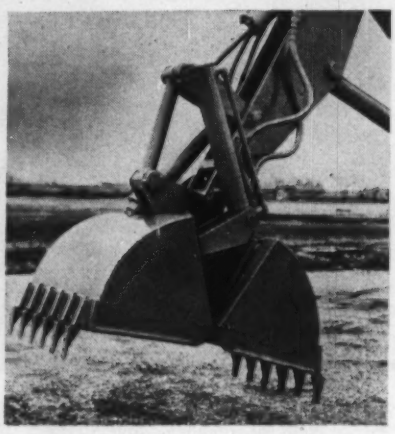
5063 27th St., Long Island City 1, N. Y.
1863 10th St., Oakland 20, California

In addition to cold working concrete reinforcing rod, smooth surface bars, square bars and flats; bending dies are available for pipe up to 1½ in. in dia.

The Ironmaster is available with an 8.4-hp Briggs & Stratton engine, a 5-hp electric motor or both. It is also available in stationary models either gasoline or electric powered. Prices start at $2,435 fob plant. MIDLAND PRODUCTS CO., MIDLAND PARK, N. J.

Clamshell Provides Pressure Either Up, Down or Forward



A clamshell attachment has been designed for Ottawa Backhoes. The regular trenching bucket is removed from the backhoe and the clamshell can be installed as a replacement in less than 20 min.

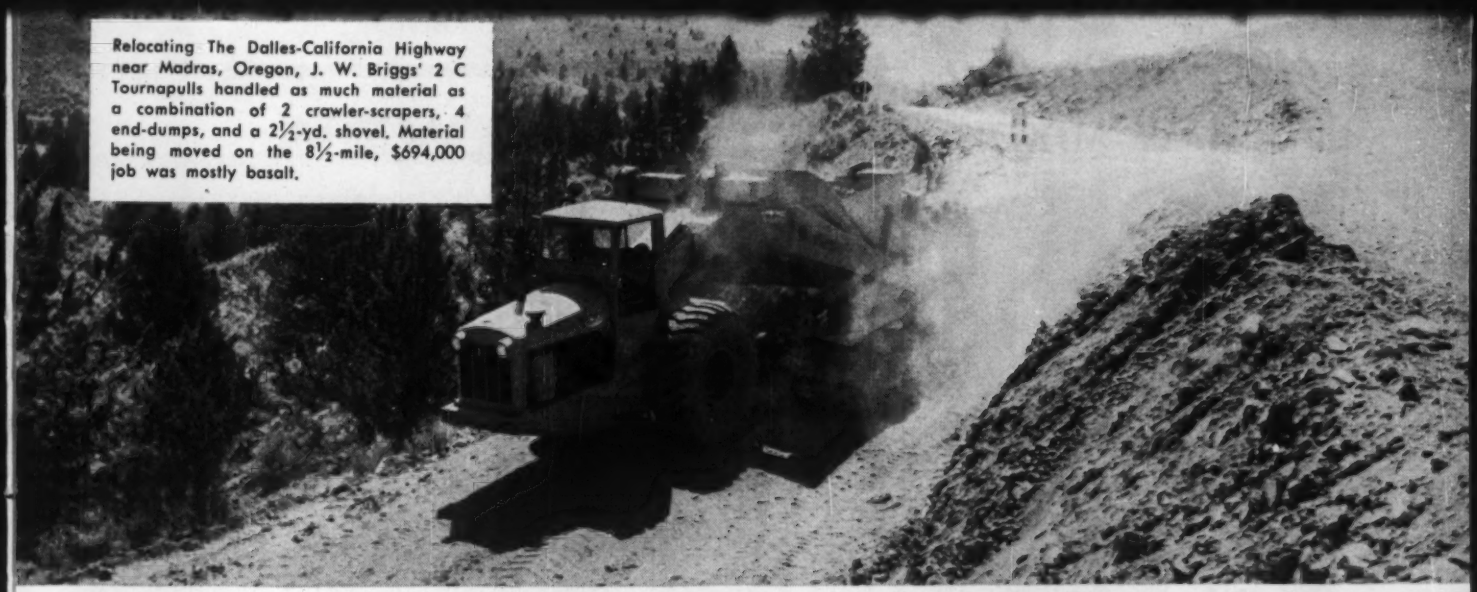
A feature of the clamshell is its down pressure, forward pressure, or up pressure as desired; forward pressure can be useful in digging under curbing, sidewalks or foundations. Further, the operator can actuate either side of the clamshell individually or both sides simultaneously when digging under and around cross lines.

Another feature is the automatic ejectors in both sides of the clamshell which are said to insure full dumping of wet sticky clay or other material.

The clamshell at full opening will dig a 30 x 44 in. hole straight down with straight sides, to a depth of 6 ft, a 30 x 66 in. hole down 8½ ft, or a 30 x 88 in. hole to a depth of 11 ft. OTTAWA STEEL, INC., OTTAWA, KAN.

Shovel-Backhoe Offers 360-Deg Swing

A new ½-yd Model 360 HOPTO has a full 360-deg swing from its travel position when the boom is extended over the cab of the truck. The completely hydraulic rig has an extension arrangement which permits straight-sided vertical digging. 60 gpm, 1,400 psi power is supplied from a 71-hp Continental M-330. The 360 offers a digging depth of 17 ft with a surface reach of 24 ft, backhoe loading height of 12 ft on a 16½-ft radius and a shovel loading height of 14 ft at the same radius. The unit mounts on any 2½-ton or larger truck and is equipped with hydraulically operated outriggers for leveling and load distribution. The operator has good visibility of all digging or loading operations from his vantage point in the enclosed cab. Badger Machine Co., Winona, Wisconsin.



Relocating The Dalles-California Highway near Madras, Oregon, J. W. Briggs' 2 C Tournapulls handled as much material as a combination of 2 crawler-scrapers, 4 end-dumps, and a 2½-yd. shovel. Material being moved on the 8½-mile, $694,000 job was mostly basalt.

"Lowest-net-cost-per-yard"... check for yourself

Largest scraper in the 10 to 13 yd. (struck) class C Tournapull has the most hp per pound and the highest top speed in its size class. It carries 400 to 1,000 lbs. less deadweight per yard of capacity. This excellent ratio of hp and speed to weight gives you faster loading, faster hauling, faster spreading for greater output per hour. Saving in deadweight lets the C Tournapull drive job-to-job over highway.

A flexible size for handling large or small contracts C Tournapull gives you 16 heaped yards capacity and high speeds for top production on large contracts... yet, with the "C", you can economically handle small contracts at a profit. It is particularly productive on those jobs where short-turning radius and ability to accelerate rapidly are important.

A choice of transmissions Only C Tournapull offers you choice of two transmissions.

(1) Sliding-gear transmission: heavy-duty, simple, reliable — (2) exclusive, patented constant-mesh transmission with low-pressure torque converter for automatic selection of speed ratio to balance load and torque. Select to best fit your haul conditions.

Automatic power-transfer On Tournapull, when one drive wheel starts to lose traction, exclusive power-transfer differential automatically applies more of power to drive wheel on firmest footing. Unit goes loaded through soft and loose materials, sand, or mud where other rigs empty often bog down. You start dirtmoving earlier in spring, keep working through bad weather, add profits later in year.

Less space to turn than any other self-powered scraper You can make a non-stop U-turn, under power, with C Tournapull, in less than 30 feet. This compares to average of 37′ for the 6 other 10 to 13-yd. scrapers.

Faster response than any other control Tournapull is the only scraper operated by electricity. Power and control is transmitted from generator to scraper control and steering motors through electric cables. You have no stresses, no leakage, reduced wear. You get instant action at all times. Only short wire rope connections from winch are needed. Motors are weather-proof, operate effectively in rain, dust, hot or cold weather.

Utilizes front-end weight for traction With steer on drive wheels, pull is always in line of travel. You have no small wheels on Tournapull to "bulldoze" against ruts and stones, to increase wear, lubrication and maintenance. Entire unit requires only 4 tires, 4 wheels, all same size . . . one spare services entire fleet.

Fast-loading, fast-dumping lightweight scraper This scraper is the result of 36 years of experience and 40,000 scrapers. Its all-welded box-beam and channel construction reduces power-consuming deadweight. Needs less cable than other scrapers, loads easily, and dumps quickly.

Simple, less delays, less maintenance, less parts stock Hinges, ball joints, reach rods and other manual steering mechanism eliminated on Tournapulls. Frames, sub-frames, hydraulics eliminated. No springs, no spring lubrication, no spring maintenance. All gearing enclosed, operated in oil . . . all high-speed shafts on anti-friction bearings. Steering and scraper electric-controlled, brakes controlled by air. Field comparisons show that both daily and 100-hour lubrication can be done in less time than on any other scraper — self-powered or crawler-drawn, positive power steer.

Big brakes for safety Tournapull gives you more braking surface per wheel than most haulers have per unit. This assures you of safe control in any weather. Operator safety and confidence are also increased by excellent visibility, low center of gravity.

Easy to operate Power steer, finger-tip controls, air brakes, eliminate need for hard work by operator. You have no end-of-shift slowdown. It's easy to learn to turn out big yardage with Tournapulls . . . inexperienced operators can maintain place in high-speed fleet operation.

Versatile for Year-Round Profits Scraper body interchanges with rear-dump, bottom-dump, crane, flat-bed, and logging arch. All units use same electric-control system, brakes, wheels. Interchangeability provides continuous operation on any type job. Fits conditions of any future project. Opens ready rental markets to contractors, mines, quarries, loggers. Spreads investment cost over longer season — a safer future.

Now . . . Entire machine, including engine, serviced by your LeTourneau-Westinghouse Distributor.

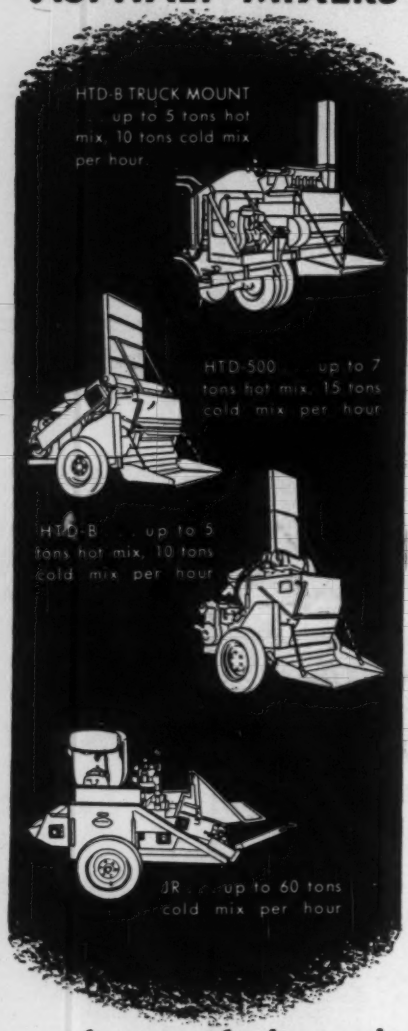
Tournapull—Trademark Reg. U.S. Pat. Off. P-734-G-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

McConnaughay ASPHALT MIXERS

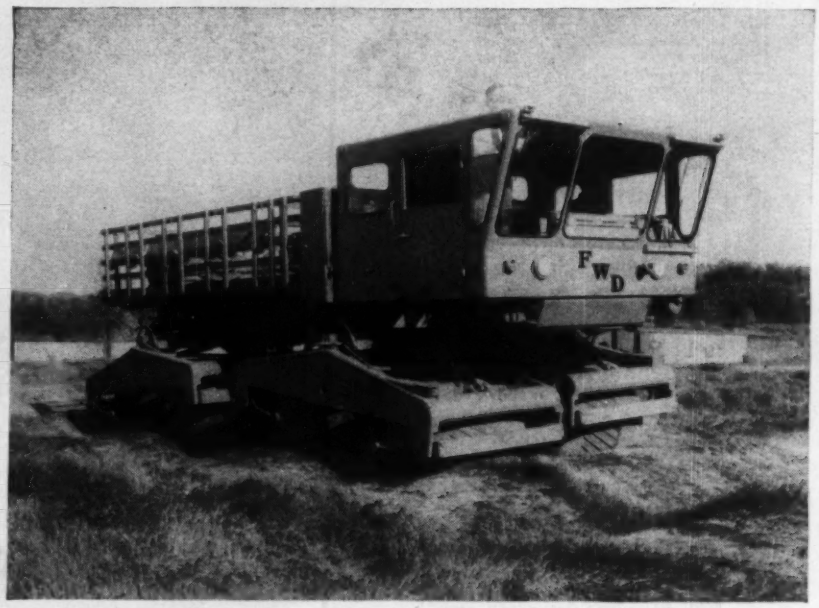

HTD-B TRUCK MOUNT
up to 5 tons hot mix, 10 tons cold mix per hour
HTD-500 up to 7 tons hot mix, 15 tons cold mix per hour
HTD-B up to 5 tons hot mix, 10 tons cold mix per hour
JR up to 60 tons cold mix per hour

. . . for resurfacing and patching in any season

Designed for economy of operation and fast production, the McConnaughay line of Asphalt Mixers meets every need for most resurfacing as well as all types of pavement patching. Working on location, McConnaughay HTD Mixers provide the *exact amounts* of materials needed and effectively remove both moisture and solvents from bituminous mixtures . . . positive assurance that patches and resurfaced areas will set up hard. For details and specifications on the mixers above and on the JR and HTD-LP models (not illustrated), write, wire or 'phone . . .

ASPHALT EQUIPMENT CO., INC.
3929 Buell Drive, Fort Wayne, Indiana
National distributors for
K. E. McConnaughay, Lafayette, Ind.

RESEARCH



Experimental Carrier Rides on Bags

A new experimental cargo and personnel carrier 12 ft wide, 25 ft long, and 10 ft high—a vehicle designed to travel over any type of terrain on eight giant air pillows—has been developed by the Four Wheel Drive Auto Co. for testing.

The carrier—dubbed the Teracruzer—is one of the first vehicles produced to utilize the new, extremely-low pressure pneumatic tire bags developed by the Goodyear Tire & Rubber Co. It was designed and built by FWD in cooperation with the Army Ordnance Corps, Detroit Arsenal, Center Line, Michigan.

Ticketed for Army Transportation Corps use, the Teracruzer is designed for safe, comfortable driving over rough and rocky terrain, over soft and unstable ground, through sand, snow, marsh, ice, and swamp, up steep inclines and along difficult side slopes. Yet it is entirely without springs. The soft, fat tire bags cushion the ride.

There are eight of these tire bags, each 3½ ft in dia, 5 ft long and inflated to 3 to 5 psi. Extremely pliable, the watermelon-like ballons absorb travel shock by conforming to surface irregularities, swallowing them up instead of resisting them.

The Teracruzer has a cab 9⅔ ft wide and 8 ft long to provide room for two men to sleep while two others, a driver and an observer-navigator whose equipment includes a plastic bubble dome in the cab's roof, operate the vehicle. In addition, the cab houses the 340-hp engine, installed in its own pressurized compartment in a handy repair location. For engine changes, the power-plant can be disconnected and lifted through the cab roof.

The cab section, with a 5-ft high interior, is completely winterized for use in sub-zero temperatures if necessary. The cab is entirely insulated and has a 60,000 Btu heater to warm batteries and engine in addition to keeping the crew compartment comfortable.

A feature of the vehicle is a forward-slanting windshield whose 18-deg angle reduces sun glare, prevents precipitation from piling up or sticking to the glass and permits observation of terrain immediately in front of the cab.

Classified at 40,000 lb gvw, the carrier has a load range of 7 to 10 tons. The vehicle has a single, 250-gal aluminum gas tank immediately behind the cab, and the body, for current experimental purposes, is of wooden stake design 10⅓ ft wide and 14 ft 10 in. long. It includes a 2-ft front section for carrying two spare tire bag assemblies, repair kits, and tools. Vehicles using the carrier design principle could have commercial applications by utilizing a materials handling or dump body, by fifth wheel mounting with semi-trailer, and other adaptations.

The vehicle has a central inflation

NEW *Styling–*
Improved PERFORMANCE

TYPE PE-A

THE LEADER IN THE AIR-CONDITIONING FIELD
THE RELIABLE PEERLESS *Fluidyne*® PUMP

LOADED WITH FEATURES:

NEW CERAMIC SEAL—The latest improved seal with ceramic and plastic seal faces results in longer seal life.

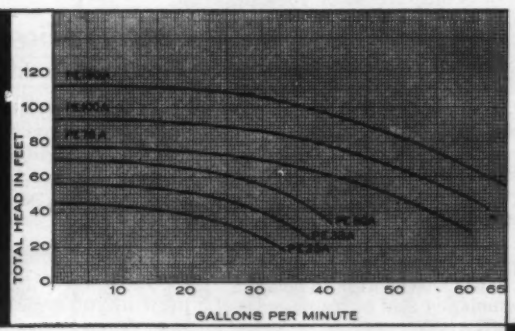
BRONZE WEAR RING—Prolongs efficient pump life. Prevents bronze impeller becoming locked with corrosion when system is shut down. Eliminates the need for breaking the impeller loose by hand when restoring the system.

CLOSE COUPLED—Short shaft results in quiet operation and longer seal life. Fits in smaller space.

IMPROVED PERFORMANCE – Capacities and heads have been improved for more efficient pumping and greater range. (Graphically portrayed at left).

NEMA TYPE MOTOR—Standard heavy duty, ball bearing motors with one piece stainless steel threaded shaft results in quiet, vibrationless operation.

Now Provides:
New–
PERFORMANCE
QUALITY
DEPENDABILITY
ECONOMY



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Distributors in Principal Cities; Consult your Telephone Directory.

intelli-Giants help build Cherry Valley Dam

Building a 7 million yd. earth and rockfill dam in two short construction seasons demands lots of good equipment working on a well organized basis.

3 Chiksan Intelli-Giants were selected by the contractor for this 14 million dollar project for the jet-compaction of rockfill.

Chiksan Intelli-Giants, with operators in sitting position, are hydraulically controlled 320° horizontally, 120° vertically—with no effort. The manual controls are operated by water pressure, with pressures ranging from 30 to 300 psi.

In the Cherry Valley Dam installation hydraulic pressure for the controls is tapped off the 8 in. water delivery line to monitor.

Water in this line is at 100 psi pressure, and the monitor nozzle puts out water at 1800 gallons per minute.

For every volume of rock placed on the dam three times the volume of water is used in compaction—jetting it into place and washing out fines.

Exacting tests in the removal of perma-frost in Alaska, sluicing in the phosphate fields of Florida, dam construction in Oregon and California have proved the high efficiency and extreme economy of the New CHIKSAN INTELLI-GIANT.

WRITE TODAY FOR DETAILED INFORMATION

CHIKSAN CO.
BREA, CALIF.
DEPT. ENR-6

CHIKSAN intelli-Giant

CHIKSAN COMPANY • BREA, CALIFORNIA • Chicago 3, Illinois • Newark 2, New Jersey
Well Equipment Mfg. Corp. (Division), Houston 1, Texas
Subsidiaries: Chiksan Export Co., Brea, Calif.; Newark 2, N.J.
Chiksan of Canada, Ltd., Edmonton, Alta.

system which permits the driver to increase or reduce air pressure in the individual bags en route. And the attachment of the bags to the chassis is accomplished by an arrangement known as controlled walking beams. These allow the driver to keep the load distributed uniformly on each pair of tire bags when compact terrain is being traversed. The walking beam design also permits tilting the front bags upward to throw vehicle weight on the rear bag of each pair when going over snow or soft terrain, with the front bag acting as a compactor in such cases.

Engine power is transmitted to all the rollers by means of four main drive shafts, each operating a set of 24 driver and idler gears to propel 12 rollers, and thus two bags.

The bags are cradled in pairs on four identical frameworks, two side by side in front and a similar arrangement in the rear. The two front frameworks are united by a superframe, which pivots on a turntable under the main chassis to provide unified steering of all four front bags. The two rear frameworks, controlling the other four bags, are affixed in stationary position to main chassis.

Hydraulic steering of the carrier is accomplished with a curved hoop tiller bar rather than a wheel and gives the vehicle a 50-ft turning radius.

The Teracruzer doesn't require high speeds because of the adverse terrain it normally is required to traverse. However, it can, when necessary, attain a speed of approximately 25 mph over generally-level surfaces.

Electron Microscope Cuts Time on Purification Tests

An RCA electron microscope, which enlarges bacteria up to 200,000 times, has enable the City of Chicago to reduce to a matter of hours water pollution tests that heretofore required several days.

The microscope is used to study incubated water samples to reveal the presence of coliform bacteria. It permits direct magnification of water samples up to 30,000 times, and photographs taken by an automatic camera housed within the microscope can be enlarged up to 200,000 times the size of the specimen.

The microscope, installed recently at the South District Filtration Plant of Chicago's Division of Water Purification, is employed to assure the effectiveness of the filtration and chlorinization processes used to convert lake waters into contamination-free water supply.

"UNPROTECTED" STEEL DECK

Withstands Raging Fire For 1 Hour-49 Minutes IN HISTORY-MAKING FIRE TEST!

HERE'S THE AMAZING SYSTEM THAT HOLDS NEW PROMISE FOR LOW COST ROOF CONSTRUCTION AND GREATER FIRE SAFETY!

Monolithic Insulation Sustains Galvanized Metal Deck In Grueling Test

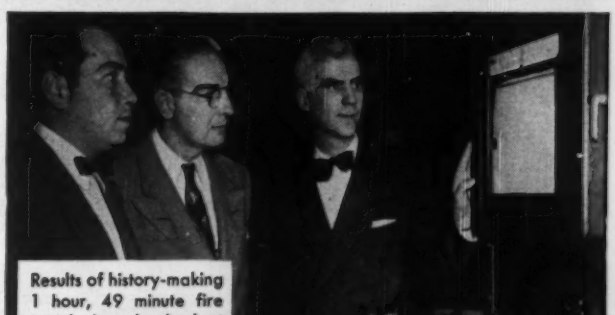
You know that unprotected rolled structural steel has a fire resistance of 15-20 minutes at temperatures of 1000°F.-1300°F. Above is the Zonolite reinforced deck that survived 1800°F. temperatures *seven times longer!*

Take a good look at the New Look in Roof Construction!

The recently conducted Underwriters' Laboratories fire test in Chicago puts the spotlight on a new, revolutionary kind of "unprotected" low-cost steel deck which is 7 times safer.

Metal Deck with 3" of Reinforced Zonolite Vermiculite Concrete on Top:

1. **Withstood fire and heat transfer for 1 hour and 49 minutes, while roof deck deflection remained well within design limits.**
2. **Withstood hose stream test following the fire.**
3. **Withstood ACI 24-hour double-loading test.**



Results of history-making 1 hour, 49 minute fire test being checked at Underwriters' Laboratories, Chicago.

ZONOLITE® VERMICULITE CONCRETE

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MAIL COUPON TODAY!

Investigate this remarkable roof system that combines insulation, maximum fire safety, and low cost. Send now for complete data on this new roof test, plus full information on Zonolite "Systems of Lightweight Construction."

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Please send me details of recent fire test, plus new booklet "Systems of Lightweight Construction."

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City.....**Zone**.....**State**.....

☐ **Architect** ☐ **Engineer** ☐ .....

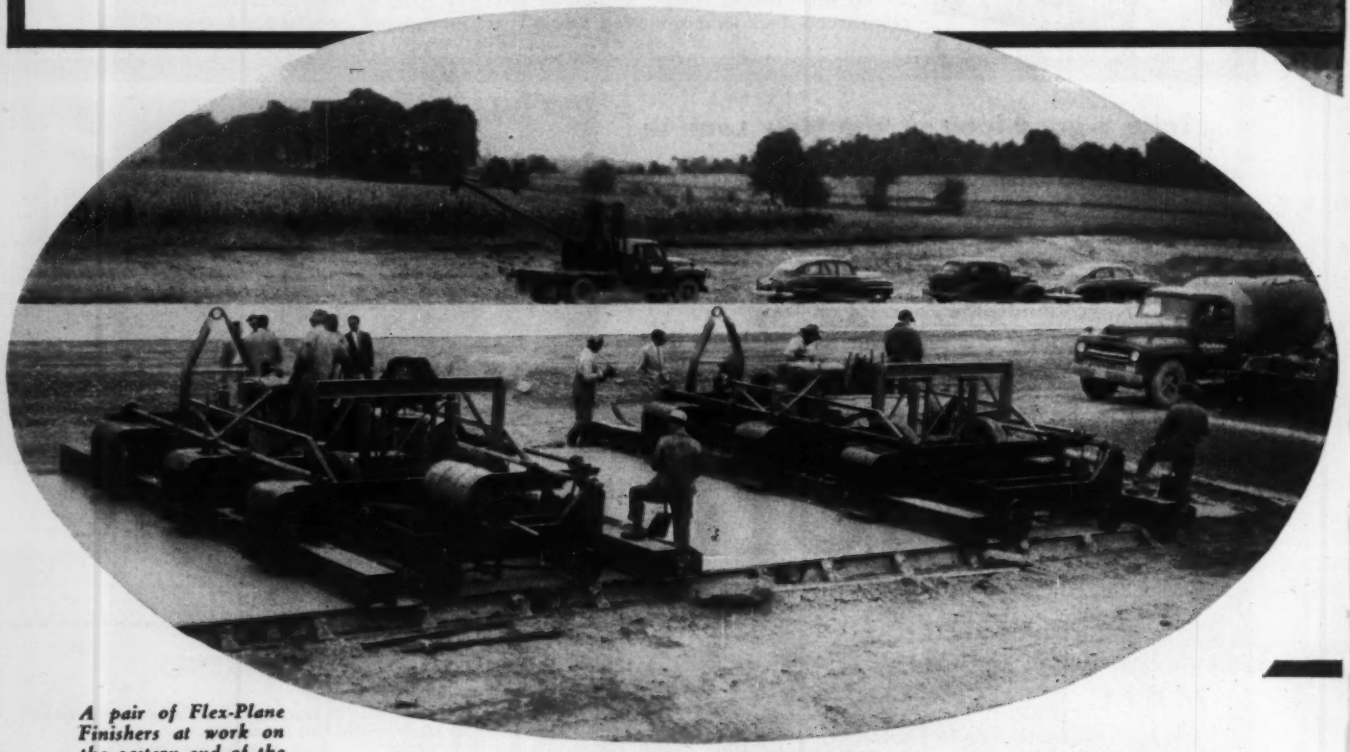
"Four reasons why the is the hottest thing in road equipment today

IT'S MOST VERSATILE!

The Flex-Plane will do everything. It converts to its own trailer by the flick of a finger. It widens — hydraulically — to suit various slab contours without leaving the forms. Its extra width range enables it to take the place of two standard finishers. It takes and holds a crown easily and accurately. In fact, whatever your operations call for, you'll find the answers in the Flex-Plane.

IT'S RUGGED— DEPENDABLE!

The Flex-Plane is sturdily constructed to give years of trouble-free service. Although it will widen beyond the maximum of other finishers it features a "triple lap" frame that will permit this extra widening without sacrificing stability. Heavy duty, extra wide screeds are mounted outside the frame for better screeding, ease of any on the job screed altering, and permitting easier "shoveling-in" in front of screeds.



A pair of Flex-Plane Finishers at work on the eastern end of the Ohio Turnpike.

THE WORLD'S LARGEST MANUFACTURER OF CONCRETE

FLEX-PLANE Finisher

Two Flex-Plane Finishers at work on a section of the Ohio Turnpike south of Cleveland.

IT'S EXTRA FAST!

Husky enough for the toughest jobs the Flex-Plane has power to spare. A unique transmission converts this power to speed when moving back down the forms. Thus, the Flex-Plane can easily keep pace with the fastest spread even when making two or three passes. It has multiple speeds both forward and reverse, with selector on the control panel. Contractors who have used the Flex-Plane find they can actually make money on repair jobs. It's that good!

IT DOES MUCH MORE!

Every part of the Flex-Plane has been thoroughly engineered and job tested on hundreds of miles of roadway — both single and double width. It's a proved piece of equipment that will give you a better finish, faster, and at less cost than any other machine of its kind. Look it over. Let us show you one in operation near you. Talk with the owner or operator and we feel sure your next finisher will be a Flex-Plane — the fastest selling finisher on the market.

FINISHING MACHINES

THE FLEXIBLE ROAD JOINT MACHINE COMPANY
4100 THOMAS ROAD
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I am interested in getting faster, better, more economical finishing. Please send me literature on the FLEX-PLANE Detroit Special.

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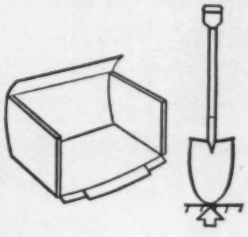
Outstanding, New Allis-Chalmers Earth-Moving Team:

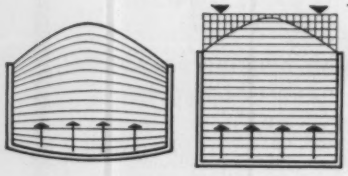
Model 315 scraper, with 20-yd heaped capacity, pulled by an HD-16 Tractor (150 net engine hp with torque converter drive, 131 belt hp with standard transmission drive).

Look At The Dirt-Moving Advantages of Allis-Chalmers Scrapers

Digs in Fast. Curved and offset cutting edge on Allis-Chalmers scrapers concentrates initial digging effort at center for faster penetration — as with a round-end, curved-bottom spade.



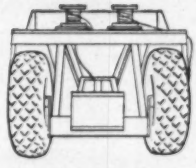
Loads with Less Resistance. Low, wide bowl reduces loading time, requires less power.



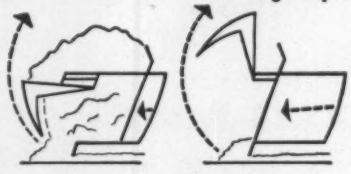
Heaps Loads with a Minimum of Spillage. Combination of deep center cut and correct angling of cutting edge loads the scraper with minimum spillage. "Boiling" action fills voids, produces automatically well-heaped loads.

Hugs the Ground for Stability. The wide, low bowl keeps scraper center of gravity low . . . wide wheel tread adds stability for working on slopes, grades, or rough terrain.

Hauls, Maneuvers Easily. Big, low-pressure tires provide maximum flotation. A short wheel base permits scraper to turn within its own length.

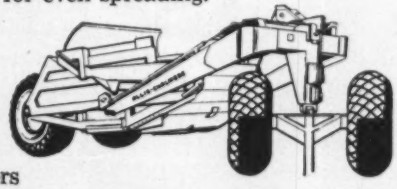


High Apron Lift Prevents Jamming. Apron lift is high — as much as 102 in. in the Model 315. Prevents any possibility of material jamming.



Dumps with Positive Ejection, Spreads Evenly. Ejector forces load forward, wipes bowl clean. Operator can control rate of discharge for even spreading.

Ground Clearance. Front-running gear has ample clearance. High carrying position of bowl enables Allis-Chalmers scrapers to clear ruts, windrows and other obstructions.

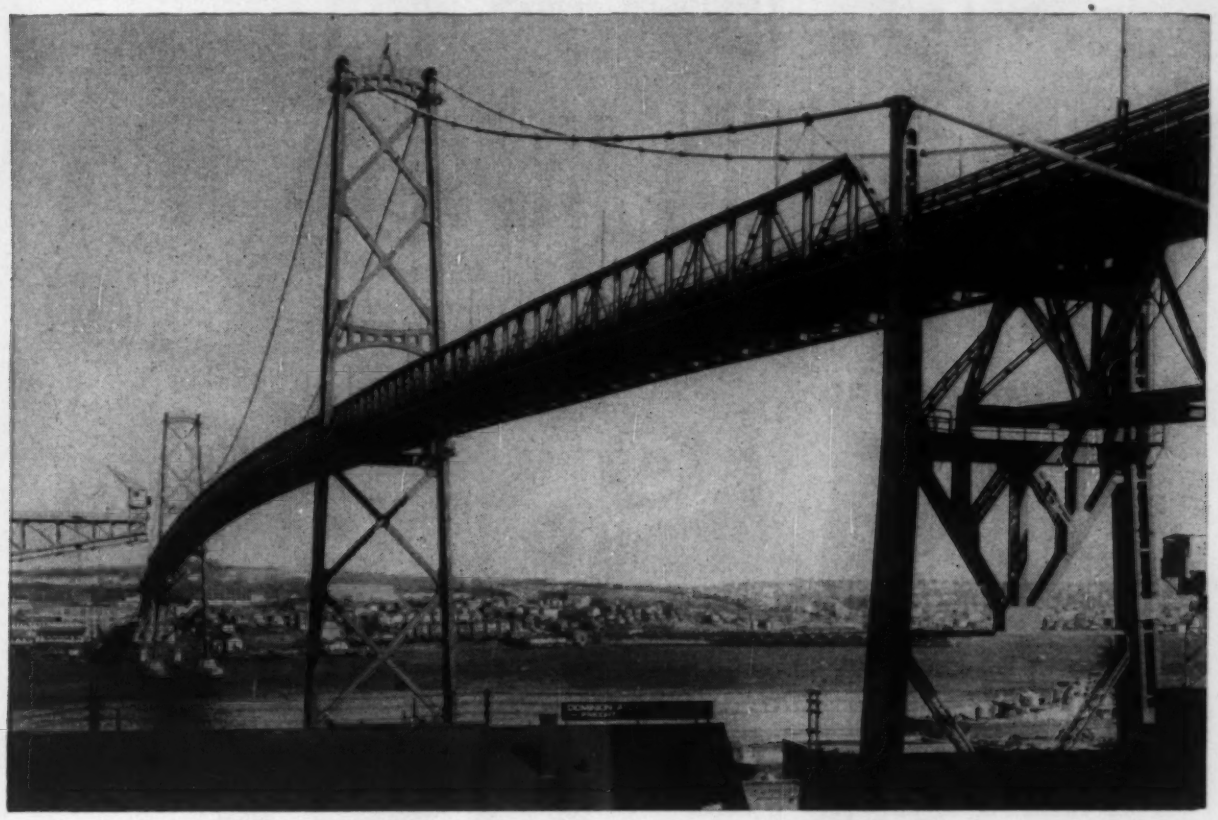


Model 315	Model 108	Model 106	Model 44*	Model 24*
15 yd struck 20 yd heaped	8.4 yd struck 11 yd heaped	6.1 yd struck 7.5 yd heaped	4 yd struck 4.7 yd heaped	2 yd struck 2 yd heaped

*Hydraulically controlled

COMPARE Allis-Chalmers scrapers with others, feature by feature, dollar for dollar, and you'll see why they are your best buy in every way.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.



MacDonald Bridge Is Canada's Second Longest

H. Hugh L. Pratley
Resident Engineer
Angus L. MacDonald Bridge

The people of Halifax and Dartmouth, Nova Scotia, said goodby recently to the ferry service that had carried them across Halifax Harbor for the past 62 years. Instead of the boats, the crossing is now made on the new Angus L. MacDonald Bridge—a suspension span that is not only the longest in eastern Canada but is also the second longest in the entire Commonwealth. (The Lions Gate Bridge at Vancouver has 768 ft more total length and its center span is 103 ft longer.)

The MacDonald Bridge is the third span to be constructed between the communities. The first two were wooden structures that were built and failed in the period between 1885 and 1893. From then until the present, passage across the harbor has been by boat alone.

The new bridge has a total length of 5,210 ft including approaches—center span length is 1,447 ft. There are four approach spans on the Halifax (southwestern) side where the ground rises rather sharply, and there are 12 approach spans on the northeastern Dartmouth side where the slope is more gentle.

The spans on the Halifax side are made up of three sets of 85-ft plate girders continuous over four supports and a 230-ft truss span which comes up to the cable bent.

On the Dartmouth side there are two groups of continuous triple spans similar to the one on the Halifax side, followed by two 150-ft truss spans continuous over three supports. The approach then turns through a horizontal angle of just under 8 deg on a 121-ft truss skew span. The remaining three spans are 165-ft trusses with the last ending at the northeast cable bent.

The 1,447-ft center span and the two 526-ft suspended side spans complete the 4,410 ft of steel work. Each of these three spans is equipped with a traveling bridge which moves along underneath to facilitate inspection and maintenance.

A 200-ft entrance and exit plaza at Halifax and a larger 600-ft plaza at the Dartmouth end make up the remaining total length of the bridge.

Foundation conditions at the site were excellent for suspension bridge construction. The towns of Dartmouth and Halifax rest on a bed of shale some 5,000 ft deep, and the configuration of the shale provides excellent reactions for both the heavy vertical loads of the main piers and the horizontal forces from the cable anchorages. All smaller piers on the approach spans are also carried to bed rock which in most places had very little over-burden.

The only place where the overburden was thick was on the Dartmouth plaza where a former swamp containing some 13 million cu yds of rotting vegetation and mud had to be removed and replaced by gravel, grading from 10-in. boulders down to sand. This gravel fill was allowed to stand for a year before commencing paving operations.

On the Dartmouth side, the tallest approach span pier is unlike the rest which are concrete shafts. Located just at the shoreline, this 90-ft pier is made up of a large steel bent on

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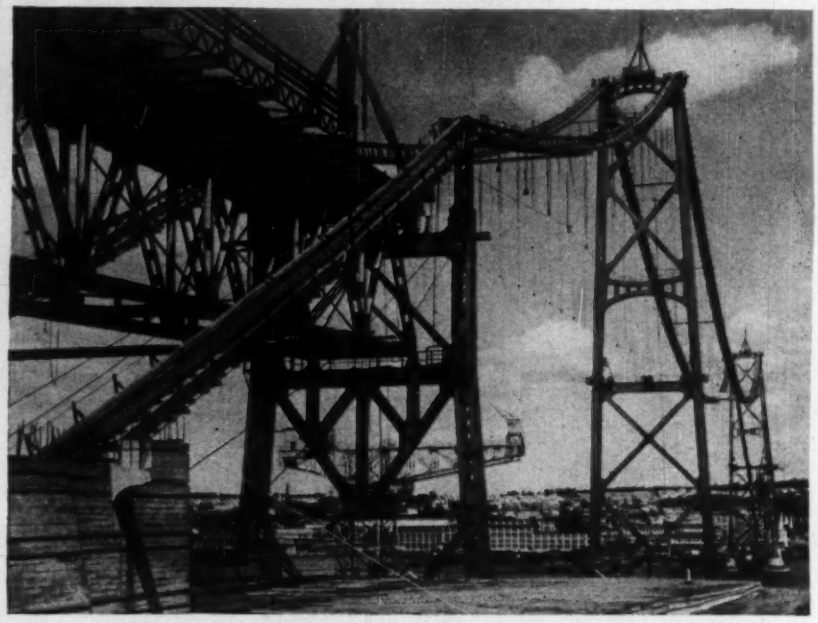


SUSPENDER ROPES in place on Halifax side. Main cable anchorage is at lower left.

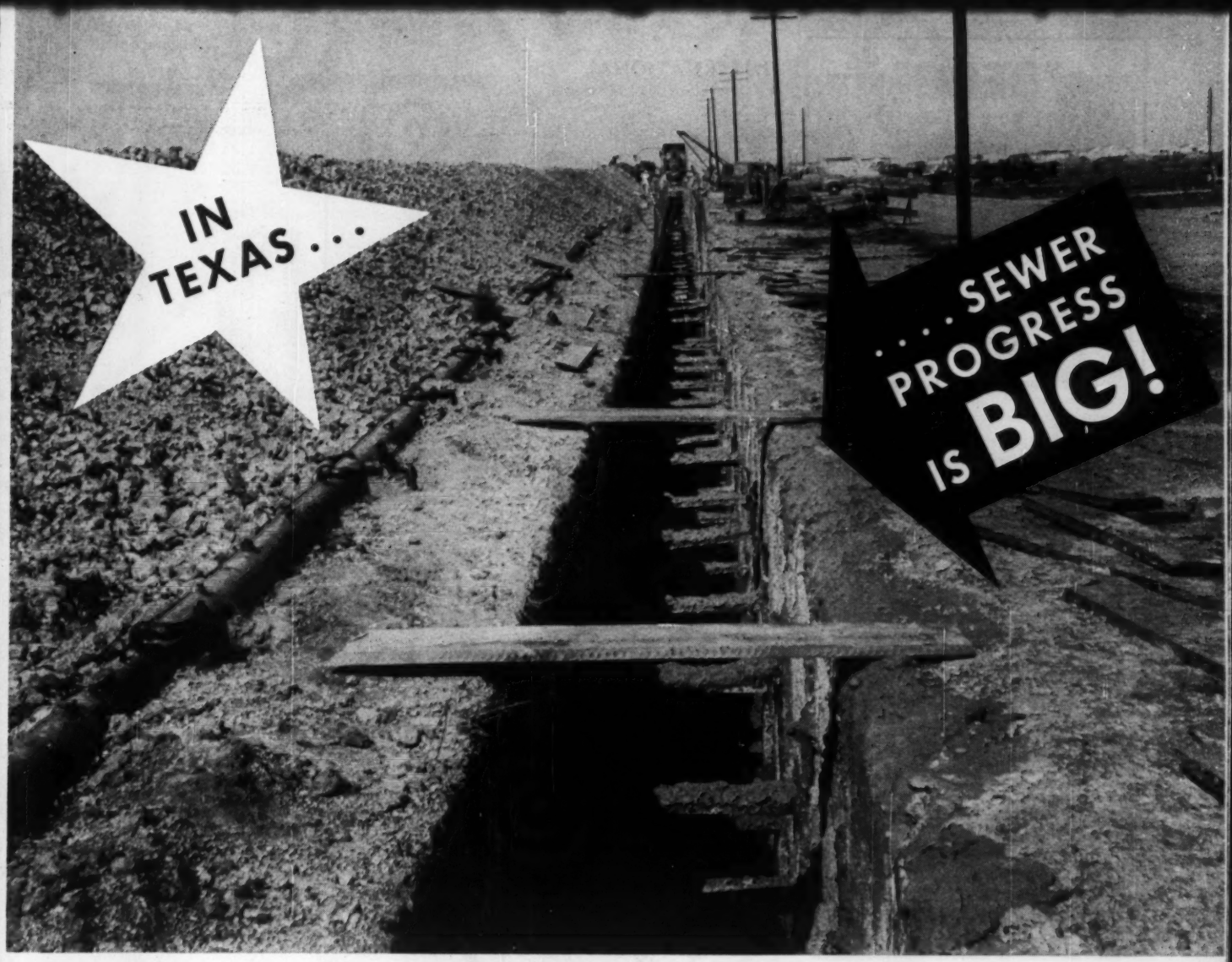
TIMBER TRESTLE, 600 ft long, carried concrete through pipe to East main piers.

two concrete pedestals. The continuous truss spans for the approaches have fixed bearings on this bent and and the adjacent concrete pier so that the bent takes up truss expansion and contraction by bending, and for this reason it is referred to as the flexible bent.

The east cable bent piers were constructed a few feet offshore inside of steel sheetpile cofferdams. The west cable bent piers were built on dry ground in a position some 40 ft above water level.

Two independent pneumatic caissons were used to build each main pier. Those for the west pier were rectangular and fabricated in place as the sinking progressed. East main pier caissons were circular, 40 ft in dia with an 18-in. heavily reinforced wall, and were prefabricated at the contractor's wharf.

The caissons were sunk to some 61 ft below low water level. After satisfactory cleaning of the rock surface, the working chambers within the caissons were concreted solid under air pressure. After air locks and man-and-material-ways were stripped, the



13th Ave. North and Westview Sanitary Sewer, Texas City, Texas.
Pumping Contractors: American Dewatering Corp., New York, Houston, Texas

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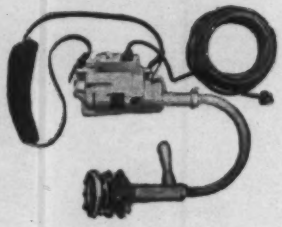

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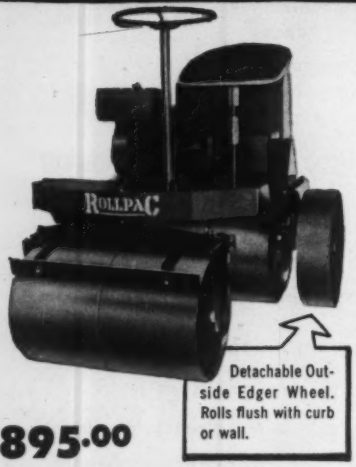

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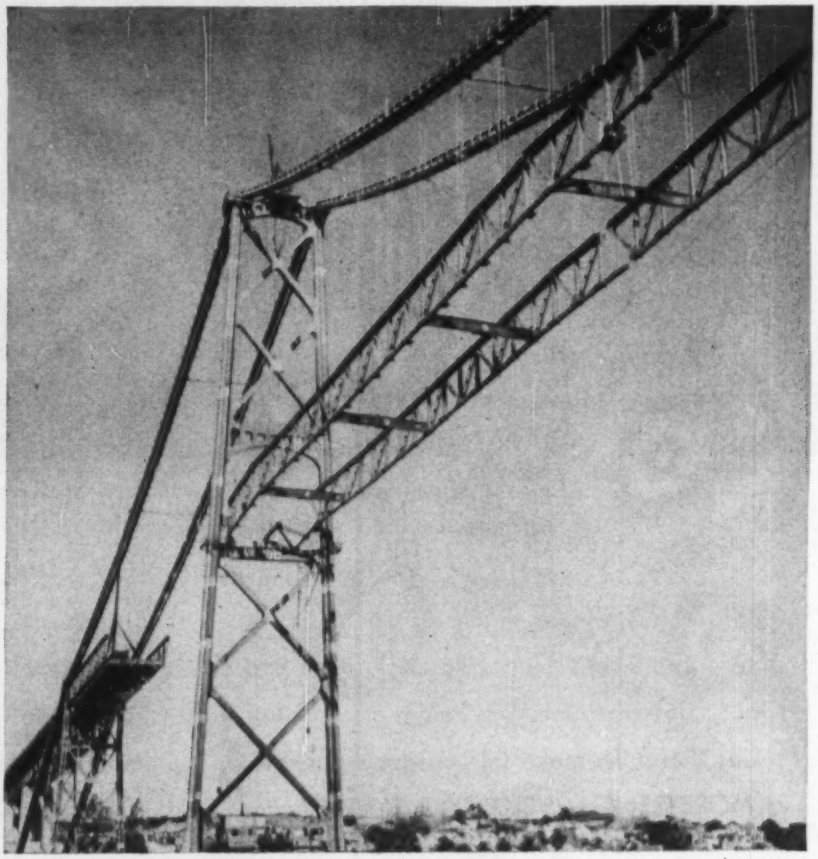
NORTH SIDE of roadway has 18-in. emergency sidewalk and a 3 ft 9 in. ductway.

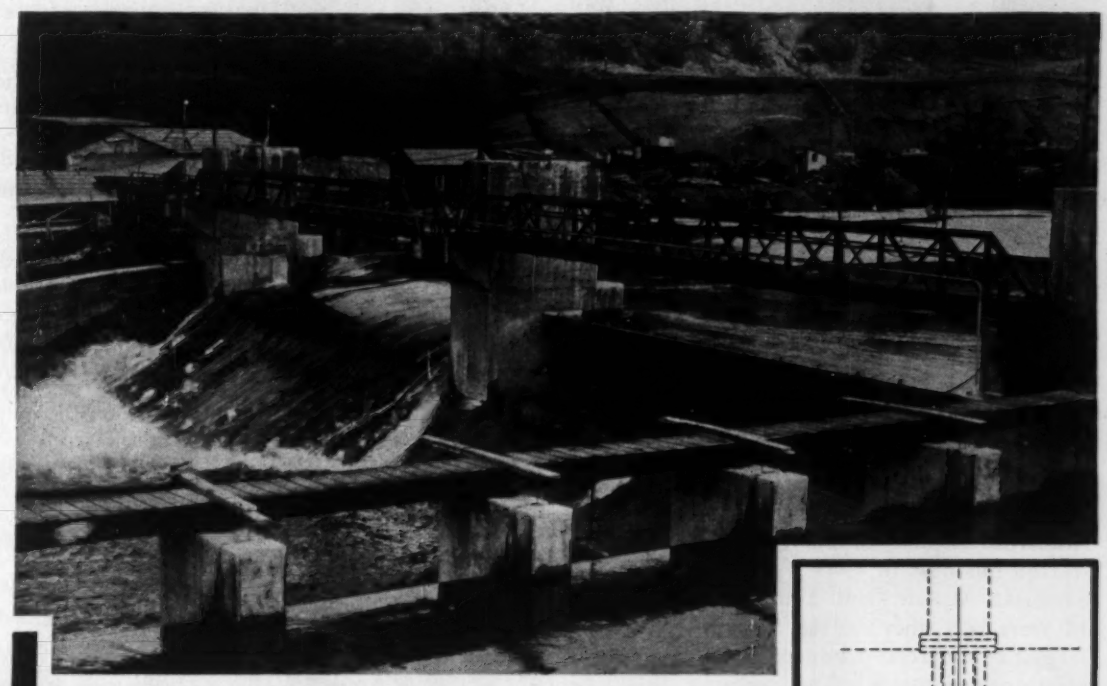


STIFFENING TRUSSES were slightly damaged during Hurricane Edna in Sept., 1954.

hollow caissons were then also concreted.

Floating of the prefabricated east main pier caissons was carried out as follows: After the working chamber wall and roof had been poured on shore, the outside forms were carried up to give sufficient freeboard and this much of the caisson was launched by lifting it from the construction platform by two floating cranes. The caissons weighed about 275 tons at this stage. When they were afloat the walls were extended upwards, the height being controlled so that the caissons would be always below water after final positioning. A temporary timber cofferdam was used to bring the wall up enough to keep out water until it was required for ballast in the caissons.

The caissons were towed out one



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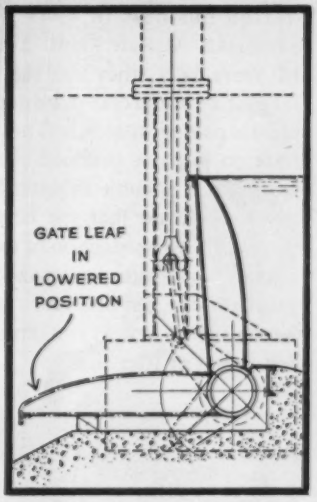
BASCULE GATES

These two SMS Bascule Gates, 7′ high and 85′ long, are on the Mississippi River at the Northwest Paper Company's Brainerd, Minnesota, mill. They are shown during a test, with one gate open and one closed. SMS turbines are also installed here for powering pulp grinders and generators.
Consulting Engineers: Hazelet and Erdall.



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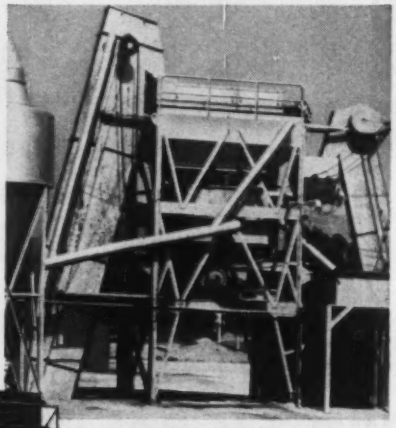

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at a time to the pier site and sunk to a prepared seat. The sloping rock bottom had been prepared by drilling, blasting and clamshell mucking from the surface. For the drilling, an independent working platform was placed on top of a structural steel tower set on a rock-filled crib. The drill itself was mounted on the horizontal boom of a stiff-legged derrick.

A 600-ft timber trestle from the Dartmouth shore out to this platform carried a pipeline from a concrete pumping machine. Sinking of the caissons was accomplished by filling them sufficiently with concrete so that they were lightly aground at high tide. In this fashion it was possible to lift the caissons clear of the bottom to reseat them after checking the position by survey.

After each caisson for the east main pier was positioned, water ballast was allowed in to counter the buoyancy of air in the working chamber and sand hogs cleaned up the bottom and undercut the rock to plumb the caissons.

About 9,000 cu yds of concrete were used on each cable anchorage with half of each anchorage lying in a rock excavation which gives excellent resistance to sliding.

For the erection of the main steel towers the timber trestle used to carry concrete to the east pier caissons was reinforced by the steel contractor and a narrow-gage railway installed on it. Sections of the tower were brought

Fact Sheet
Angus L. MacDonald Bridge

Overall length—abutment to abutment	4,410 ft
Length of main span between towers	1,447 ft 2 in.
Length of side suspended spans	526 ft 7 in.
Height of towers	309 ft
Minimum clearance under main span	165 ft
Total weight of steel in bridge	8,227 tons
Length of main cables	3,140 ft
Diameter of each of main cables	13.5 in.
Number of strands in each cable (strands laid up hexagonally)	61
Number of wires in each strand	51
Diameter of each individual strand	1½ in.
Width of roadway	27 ft
Width of sidewalk	5 ft 3 in.
Cost of bridge	$10,750,000 (approximately)

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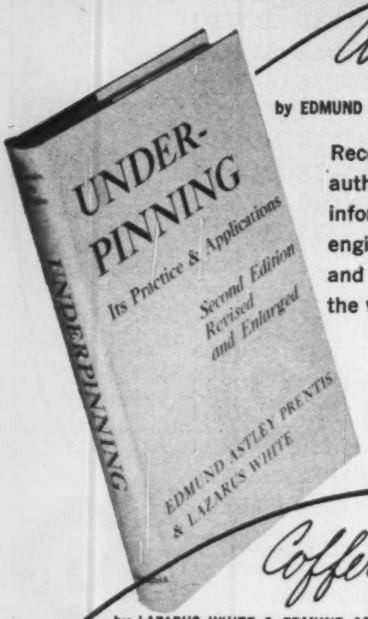

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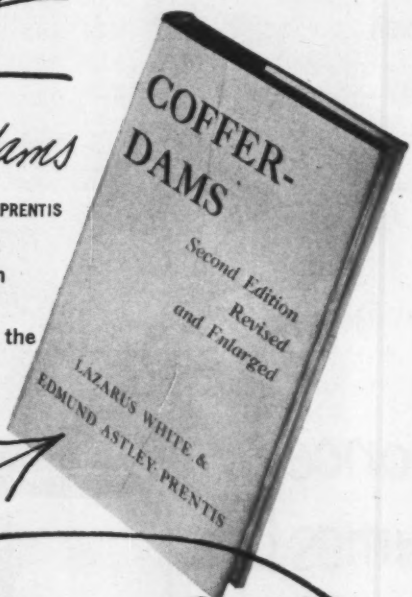

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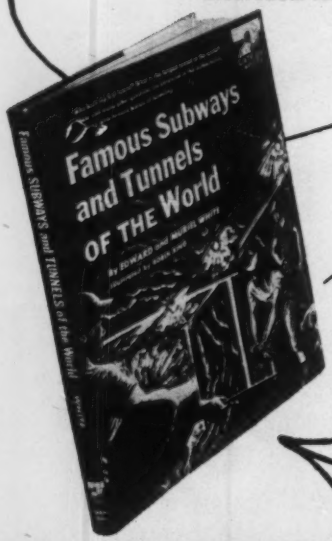

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by rail and unloaded from cars directly onto the surface track where small cars carried them to the base of the tower. There, a derrick picked them up for erection. Both catwalk strands were hauled across the harbor and hoisted to position in one day.

When the final cables had been spun and the cable bands—146 in number—were placed, erection of stiffening trusses was begun immediately. Owing to restricted railway clearances, the trusses were shipped to the site knocked down and then sub-assembled onto panels at the site. Center span stiffening trusses were hoisted from scows in the harbor.

Only every sixth floor beam was placed in the center span during truss erection in order to get the first truss work completed as quickly as possible and thus keep the shoreward tower deflection within permissible values.

When the famous Hurricane Edna passed through Nova Scotia in Septemper, 1954, erection had proceeded to a point where the north truss had reached both towers and the south truss was one panel short of the west tower but connected to the bracket on the wind strut of this tower. The center span, having no bracing in this case, could hardly be expected to escape unscathed in wind velocities up to 86 mph. Damage nevertheless was quite slight. At the height of the storm, lateral deflection at the center was estimated at some 12 ft and vertical undulation worked many drift pins out of the bottom chord splices, leaving only four or five bolts which in four places sheared, permitting the truss sections to separate. Splicing steel was bent at about a dozen panel points but was easily straightened. The end panel of the south truss, however, tipped northward in the wind, twisting the bottom chord through 90 deg. A new section of bottom chord was fabricated for this panel, and two other panels, where bolts had torn the webs before shearing, were similarly treated. Total delay due to the hurricane was three days, including repairs to the catwalk floor, and material damage amounted to less than $1,000.

In erecting the trusses, since nothing like dead load of the final span could be imposed, the panels assumed an exaggerated vertical curve and only the bottom chords could be connected, with pins, and these only partially since few holes matched. As the profile of the stiffening trusses changed as more of the cable was loaded, rotation occurred at these bottom chord joints until finally all holes could be riveted. To prevent the

trusses from absorbing dead load stress, riveting of the top chords was not carried out until all concrete was in place. In fact, very few bottom chord splices were riveted before pouring the concrete roadway, thus minimizing bending stresses in the chords.

The roadway floor on the three suspended spans consists of a 3-in. I-bar grid filled with concrete. These grid sections were kinked to fit the roadway crown and welded down after riveting stringers and floor beams. Concrete was placed rapidly in these sections as the transit mix trucks could travel directly on the unfilled grids.

The cables themselves are laid up in nine layers of strands to form a hexagon. To get a circular section for the cable appropriately curved cedar strips were laid before wrapping.

Anchorages for the cables consist of a group of seven steel buttons, each held by three heavy bolts imbedded in the concrete mass and provided with hooked ends. The backs of the buttons are machined to a spherical surface of 30-ft radius with the center at the splay point of the stranded cable. The center button anchors seven strands and each of the other six anchors nine, accounting for the 61 strands of the cable. The anchor chambers are always accessible for inspection through passageways, and fresh air ventilation is provided to inhibit condensation of moisture on the steel.

The total width of roadway for the Nova Scotia bridge is only 27 ft between curbs, providing a wide two-lane highway. There is a 5-ft 3-in. sidewalk on the south side, and on the north side, space corresponding to the sidewalk is occupied by an 18-in. wide emergency sidewalk and a 3-ft 9-in. ductway with an open grid floor to carry power, telephone and other cables. One of the most important uses to which this ductway will be put is the carrying of a 30-in. water main at sometime in the future. Existing water supplies are not capable of any great expansion and it is expected that in the not too far future it will be necessary to carry water from Dartmouth to Halifax.

On the Dartmouth side the 27-ft roadway is broadened to 150 ft to form a toll plaza with ten lanes and nine toll booth islands—the center booth is a double one. An administration and maintenance building is provided to the south of the plaza.

The general contractor for the steel superstructure was Dominion Bridge Co. Ltd., with sub-contracts awarded to Maritime Steel and Foundries, New Glasgow, N.S., Robb Engineering Works, Amherst, N.S., Saint John Drydock Co Ltd., Saint John, N.B.,

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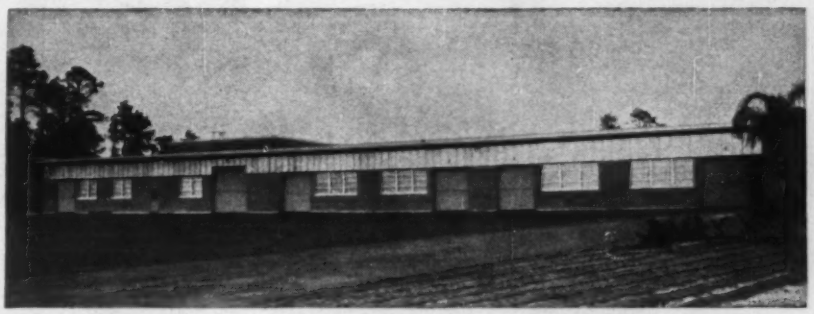

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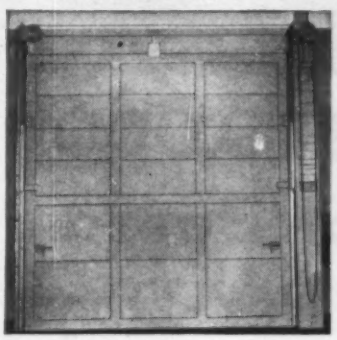

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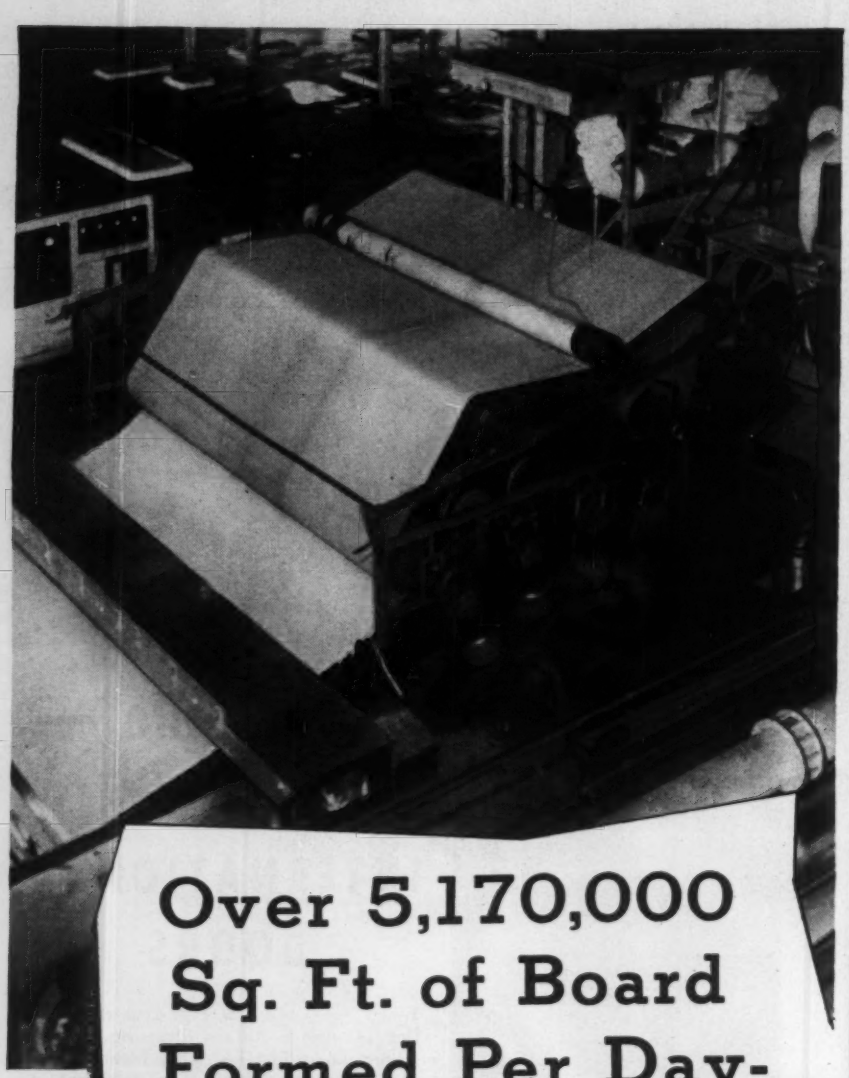

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and Canadian Bridge Co. Ltd., Walkerville, Ont. Dominion Wire Rope & Cable Co. Ltd. fabricated the cable strands and suspender ropes. Paving of the superstructure including filling the grid flood was carried out by Fundy Construction Co., and the electrical contractor was Canadian Comstock Co. Ltd.

International Briefs . . .

• **Greek hydro scheme**—Greece will apply money from a $15 million Italian war reparation debt toward its biggest post-war scheme—development of a 180,000 kw hydro-electric installation on the Acheloos River. The project, expected to cost $45 million, will boost electric power output by about 50%.

• **Albanian power plant**—Albania's largest project this year will be construction of a hydro-electric power plant on the Mati River. When completed in 1956, it will double the country's electric energy production.

• **Lima's tallest building**—Construction will start shortly on the 22-story central section of Peru's new Ministry of Public Education Building—the highest structure in Lima. Two 11-story reinforced concrete wings of the $3.5-million building already have been completed.

• **Pakistan port plans**—The Pakistan Industrial Corp. and West German firms (Krupp in Essen, the Stuelcken yards at Hamburg) are thinking of teaming up to modernize and develop harbor and river installations at Karachi, Chittagong and Chalna. According to present plans, German technicians would remain in Pakistan after construction is ended to train local personnel in shipbuilding.

• **Iraq's expensive dam**—Iraq's Ministry of Development has called for bids on what will be the most expensive dam in the country—a $56-million one on the Diyala Sirwan River some 186 miles east of Baghdad. Plans call for either a concrete gravity or a rockfill structure with a capacity of about 4,000,000,000 cu meters.

• **Litani River project**—Lebanon's Litani River project will get under way in June with a start on irrigation projects in the southern Bekka and southern coast. The first hydro-electric phase of the project will be carried out at Joun and Bisri, where two power plants will be built to produce a total of 99,000 kwh.

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304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

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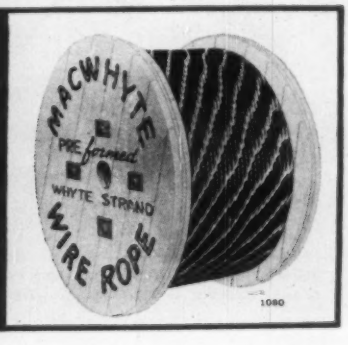
MONARCH WHYTE STRAND is supplied in a *thousand and one* types, sizes, and grades. It is made Internally Lubricated, PREformed or non-PREformed, Lang Lay or Regular Lay, with Fiber Core or Independent Wire Rope core. Wire combinations in one single rope vary from *42* wires in 6 x 7 construction to *343* wires in 6 x 49 IWRC. **WHYTE STRAND** is made in all Wire Rope Classifications . . . so there is a *right* rope for every equipment need.

Write for MONARCH WHYTE STRAND Bulletin 5425

For proper wire rope size and construction for your equipment, request a Macwhyte recommendation.

MACWHYTE WIRE ROPE



Across the Border

Vancouver engineer sees building boom for paper

When P. R. Sandwell got back to his home base in Vancouver, British Columbia, a few weeks ago, after circling the globe twice within three months, his briefcase was bulging with notes on plans and surveys for nearly $100-million worth of projects—primarily for the pulp and paper industry—in Pakistan, Mexico, England, Sweden, Brazil, France and the United States.

It was only six years ago that Sandwell founded the Vancouver consulting engineering firm of Sandwell & Co., Ltd., of which he is the president. Today the company is playing an increasingly important role in the world-wide growth of the pulp and paper industry, which Sandwell says is now in the midst of its greatest expansion.

Working with Sandwell on his basic team are Sherry Ford, assistant chief engineer; Sven Quist, development engineer; A. E. Frankfurter, Seattle resident engineer; Peter Vakomies, operational liaison engineer; E. S. Barton, resident engineer for Murupara Project; and Hugh Horn, director and treasurer.

Some of the projects which the company is presently engineering are these:

- A 35,000-ton annual capacity paper mill in East Bengal, Pakistan, estimated to cost $20-million and to take 2½ years to construct.
- A 30,000-ton annual capacity mill for the Tuxepec Paper Co. near the Gulf Coast, east of Mexico City. Its estimated cost is $10-million. Engineering has started and construction work is scheduled to begin when the rainy season ends in September.
- Magazine and newsprint mill expansions to the tune of about $15-million in southern England and northern Sweden.
- A $20-million newsprint and kraft paper mill in southern Brazil, for which surveys are now underway.
- Surveys in southern France for a $30-million venture into production of pulp and paper from native pine, now made economical by the discovery of oil and natural gas.
- A pulp and paper mill at Albany, Ore., to be completed by the end of this year.

Neither the pulp and paper industry nor boundary-hopping is new to

P. R. Sandwell

43-year old Sandwell. Born in London and educated in British Columbia, he worked for several years in Montreal before shoving off in 1940 for Tasmania, where he worked as resident engineer on Australian newsprint projects. Returning to Canada in 1944, Sandwell became assistant chief engineer for Ontario Paper Co. and its subsidiaries at Thorold, Ontario. Two years later he moved to Vancouver, working as chief engineer for the Powell River Co. until he established his own firm in 1949.

What Chance Have Engineers To Become Business Bosses?

Top-level personnel changes in the Canadian Pacific Railway Company, one of the world's biggest transportation systems, give a boost and a challenge to the engineering profession.

Although higher positions in the company have usually gone in the past to lawyers or operating executives, the company now boasts graduate engineers—two civil, one mechanical—as board chairman, president, vice president.

Newly-elected chairman of the board is W. A. Mather, former president and a civil engineering graduate of McGill University.

Succeeding him as president is N. R. Crump, mechanical engineering graduate of Cornell University, who joined the company as a laborer 35 years ago. A native of Canada, Crump at 51 is one of the youngest senior railway executives ever appointed by a Canadian railway.

In one of his first appointments, Crump named R. A. Emerson as vice president in charge of operation and maintenance. A civil engineering graduate of the University of Manitoba with a master's degree from Yale, Emerson has been the company's chief engineer since 1951.

(*Men and Jobs continued on page 88*)

District of Columbia Engineer Gets His Star

Thomas A. Lane, Engineer Commissioner for the District of Columbia, has been promoted to the rank of brigadier general. The stars were pinned on by Maj. Gen. S. D. Sturgis, Jr., Chief of Engineers, and Mrs. Lane at a ceremony witnessed by Maj. Gen. B. L. Robinson, Deputy Chief of Engineers for Construction. Brig. Gen. Lane was commissioned in the Corps of Engineers in 1928 following his graduation from the United States Military Academy.

SOILS and FOUNDATION ENGINEERING

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EXPLORATION DEPARTMENT

Undisturbed Soil Sampling a Specialty—Shelby Tube and Piston Samples up to 5" Diameter—Denison Core Barrell Samples—Load Tests—Pile Tests

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Triaxial Compression—Consolidation — Unconfined Compression—Compaction (AASHO and Modified)—CBR—and all other standard soil tests.

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Foundation Investigations for New Plant Sites — Landslide Studies—Analyses of Foundation Failures—Design of Embankments and Earth Dams—Compaction Control — Special Soil Mechanics Studies

GREER & McCLELLAND

Consulting Engineers

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HOW TO DESIGN REINFORCED CONCRETE MEMBERS

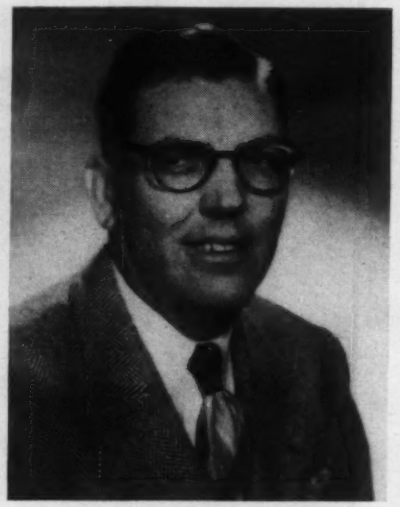
IN 30 SECONDS!

New CRSI Handbook has thousands of finished designs all worked out! Does away with laborious formulas and calculations. Simply locate the table covering the member you are designing, apply span and load requirements then *read off directly* concrete dimensions and reinforcing steel data. Follows latest codes and practices. Money-back guarantee, if book returned within 10 days. No C.O.D.'s, please!

Awarded Certificate of Merit, 1954 Building Products Literature Competition, sponsored by The American Institute of Architects and The Producers' Council, Inc.

Concrete Reinforcing Steel Institute

38 South Dearborn St., Chicago 3, Ill.



R. A. Nyquist

Libbey-Owens-Ford Expands Its Engineering Department

To meet the demands of its big building program undertaken for additional plate glass facilities, Libbey-Owens-Ford Glass Co., Toledo, Ohio, has expanded its engineering department and promoted some of its key engineers.

Heading the list of those promoted are Roy A. Nyquist, director of engineering, and Emmett L. Walters and Russell W. Abbott, associate directors of engineering. Each of them has played an active part in the already completed phases of the company's extensive development program. They're now engaged in pushing construction of two new plate glass furnaces, a new grinding and polishing plant, and expansion of the company's laminating facilities located in East Toledo.

As director of engineering, Nyquist succeeds William H. Hasselbach, recently elected vice president in charge of engineering (ENR, May 19, p. 74). He's been with the company for 21 years—four of them as chief engineer. A past president of the Toledo section of ASCE, the new director is a member of the American Concrete Institute, is serving on the Governor's Committee of 100 for Water Conservation and is vice chairman of the research and surveys task force watershed conservation plan committee of the Ohio Forestry Association.

New associate director Walters was formerly the company's chief mechanical engineer and has been associated with the glass industry for 28 years. He's been active in the engineering and development of sheet and plate glass machinery and has made a comprehensive study of production methods and equipment abroad.

Abbott has been with the company for 14 years and has supervised the design and construction of several of the outstanding structures in the glass industry. Former chief structural engineer for the company, he holds a master's degree in civil engineering from MIT and is a past president of the Toledo section of ASCE.

Frank R. Creedon Joins Merrit-Chapman & Scott

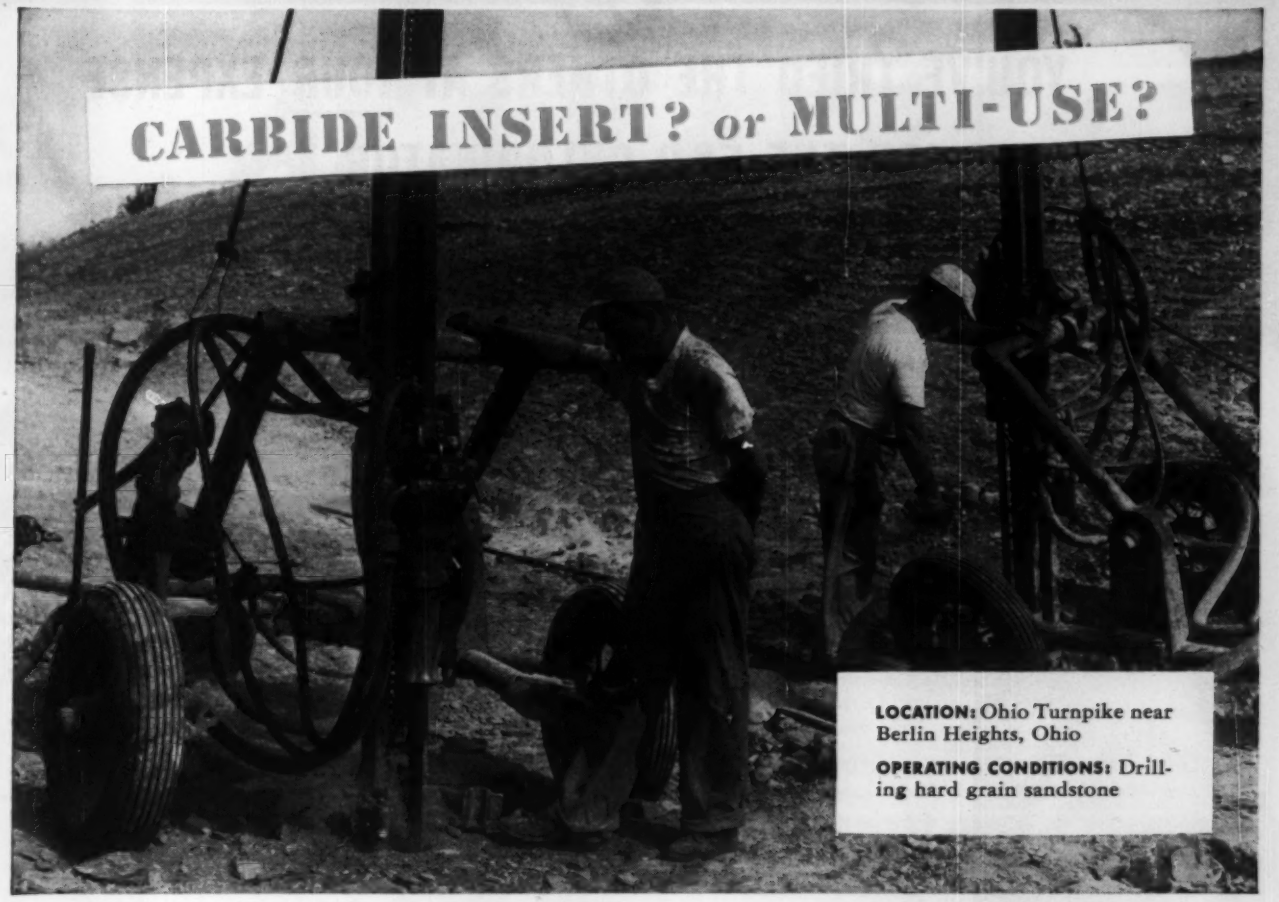
Frank R. Creedon, former director of installations for the Department of Defense, has joined Merritt-Chapman & Scott Corp. as an executive of the company's construction division. He will serve as assistant to Charles A. Richardson, vice president in charge of M-C&S's marine and heavy construction department.

Creedon was recently associated with Uhl, Hall & Rich, Boston engineering firm, as acting resident project manager on the St. Lawrence Power Project.

A native of Brockton, Mass., and a civil engineering graduate of MIT, he was active in military and defense construction during the war and was awarded the Medal for Merit in 1947 in recognition of his services. Projects with which he was associated included the Army's ordnance and chemical warfare plant expansion program, the synthetic rubber plant construction program of the War Production Board, and construction of the atomic energy plants at Oak Ridge, Tenn., and Hanford, Wash. After serving as National Housing Expediter and as chief of the Facilities and Construction Bureau of

(*Continued on page 92*)

F. R. Creedon


CARBIDE INSERT? or MULTI-USE?
LOCATION: Ohio Turnpike near Berlin Heights, Ohio
OPERATING CONDITIONS: Drilling hard grain sandstone

Switch to TIMKEN® multi-use bits helps lower cost of drilling sandstone on Ohio Turnpike for H. N. Rodgers & Sons Company

WHEN H. N. Rodgers & Sons Company started drilling 230,000 yards of sandstone on the Ohio Turnpike near Berlin Heights, Ohio, they found their costs were running too high. After analyzing their technique, they made some changes. One was a switch to Timken® multi-use bits. Now costs are down. And Timken multi-use bits have been used ever since.

Timken multi-use bits usually give best results when you drill ordinary ground. With correct and controlled reconditioning, they give the lowest cost per foot of hole when full increments of steel can be used.

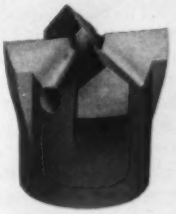
But they may not be the best answer for *all* your drilling problems!

When ground is hard or abrasive, Timken carbide insert bits drill faster and more economically. They're your best bit for constant-gauge holes, small diameter blast holes and extremely deep holes.

Timken multi-use and carbide insert bits also save time when your drillers change bits. They're interchangeable in the same thread series. And dozens of different Timken bits fit the same drill steel.

Both Timken multi-use and carbide insert bits are made from electric furnace Timken fine alloy steel. Both have special shoulder unions that protect threads from drilling impact.

To find out which type bit will cut costs most on your job, call on the Timken Rock Bit Engineering Service. Write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

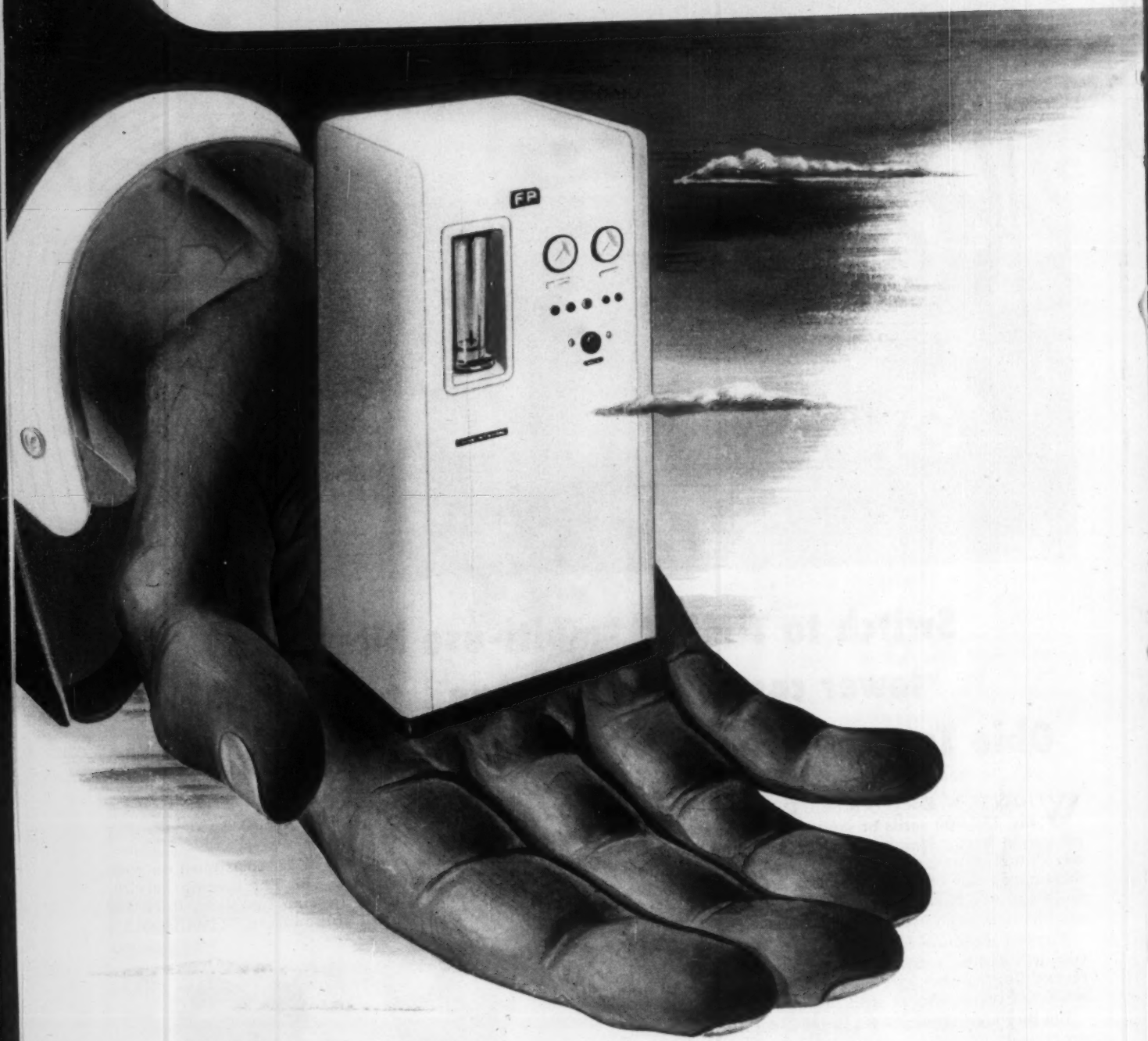
your best bet for the best bit ... for every job

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

YOU'VE TRIED THE OTHERS AT YOUR EXPENSE

NOW TRY THE F&P CHLORINATOR



. . . AT MY EXPENSE

"Because there are so many good and valid reasons why our Chlorinator merits your deep consideration, I'm signing this advertisement. I am Kermit Fischer, President of Fischer & Porter Company.

Fischer & Porter Company has been in business since 1937, making chlorine control systems for all of the eighteen years since then. In 1949, after years of experimentation and development, we put our first 'packaged unit' chlorinator into service at Winter Park, Florida waterworks — where it has been operating successfully ever since. In May of 1952 we retooled our chlorinator production, incorporating into our basic design all the improvements made possible through the experience gained at Winter Park and some fifty other installations. Now there are more than 1000 of the new model F&P Chlorinators in daily use—and all our customers tell us it is the best chlorinator they have ever used.

HERE ARE SEVEN REASONS WHY I CAN MAKE THIS GUARANTEE OFFER TO YOU WITH CONFIDENCE . . .

1. SAFEST . . . The F&P Chlorinator is completely safe because it uses instantaneously operating mechanical instrument type safety devices. Any malfunctioning shuts off the chlorine supply instantaneously—but the chlorinator automatically starts operating again when the trouble has been corrected. There are no bell jars—exposed or otherwise—with water seals, so there are not the time delays these outmoded components introduce to the safety system.

2. MOST DEPENDABLE . . . Many F&P Chlorinators have operated for over a year at a time without being shut down for any repairs or replacement parts or for cleaning. Even connecting chlorine to the water inlet and water to the chlorine inlet did not faze one customer's chlorinator. After the connections were reversed, the chlorine system sucked itself dry and the chlorinator started up automatically.

3. MUCH LOWER FIRST COST . . . Simplified design, mass production methods, *mechanical* principle of operation, modern instrument engineering, make it possible to supply the new F&P Chlorinator at far lower first cost than the old hydraulic bell jar chlorinators.

4. MUCH LOWER MAINTENANCE COST . . . Not one, not a dozen, but *every* present user of F&P Chlorinators has stated unequivocally that the F&P Chlorinator cuts the maintenance bill to nil—whereas formerly maintenance cost was a major item.

5. NO CORROSION, NO SCRAPING, NO PAINTING . . . Because the cabinet is made entirely of fibre glass—without any internal metal bracing—it cannot corrode, does not have any paint or other finish coat to be renewed. *All* the internal parts are also completely resistant to attack by chlorine, by water or wet mixtures of the two so there is nothing to deteriorate, nothing to scrape, nothing to repair.

6. SIMPLEST TO OPERATE . . . The F&P Chlorinator is so simple that no skill is required either to operate or install. No foundation, no bolting. Just attach piping to the connections labeled 'chlorine,' 'water,' 'drain' and 'vent'—then turn on the chlorine and water valves (either one first) and you're off. Anybody can do it. Anything he does wrong (if he can find something wrong to do) simply shuts down the chlorinator.

7. PROVEN IN USE 1000 TIMES OVER . . . Sales of F&P Chlorinators have increased by leaps and bounds. Over 1000 present users are all saving money day in and day out.

These are provable and proven facts. We can give you every evidence you need of user satisfaction. But I still want you to make up your mind on the F&P Chlorinator, by actual test, *under your own operating conditions.*

All I ask is that you write to me now. Don't wait for repair bills or breakdown to start you thinking about better chlorination equipment. Merely tell me your chlorine capacity requirements, your ejector water supply pressure, your solution discharge pressure and I'll do the rest. You'll be under no obligation whatsoever. I stand on my faith in our Chlorinator. I know that it will win your enthusiastic support, that it will outperform any other chlorinator ever offered. All I ask is that you convince yourself—by trying it at no cost to you.

Will you write to me today—and ask me to prove what I say—*right in your own plant*—under your own operating conditions?"

Kermit Fischer

President.

complete process instrumentation

FP FISCHER & PORTER CO.

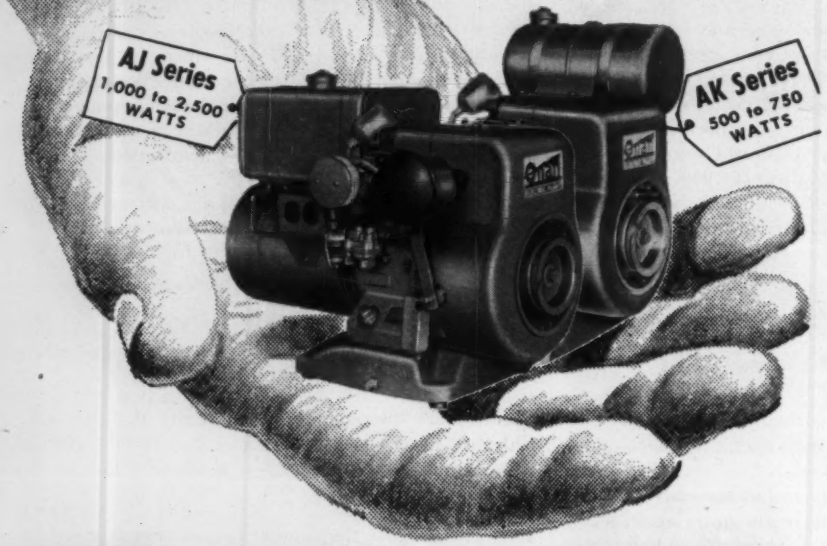
1755 Fischer Road, Hatboro, Penna.

A1014

18 YRS. EXPERIENCE SUCCESSFULLY MANUFACTURING CHLORINE FLOW METERING EQUIPMENT

ONAN Announces Two New Series of

POWER PACKED ELECTRIC PLANTS



MORE POWER, LESS WEIGHT, SMALLER SIZE, LOWER COST!

2,500-watt unit weighs only 154 pounds! Gives you more power per dollar than any other 4-cycle electric plant.

Higher output in a smaller, lighter package give these new Onan units marked advantages for every type of service . . . portable, mobile, primary, or emergency standby.

Wherever you use *portable* electric plants, you can now put more cost-cutting electric light and power to work for you . . . at less cost. In *mobile* applications you can take along more power in less space . . . with less weight. In *primary* and *emergency* standby applications you get more power at less cost with all the Onan advantages of quick starting, long life and easy maintenance.

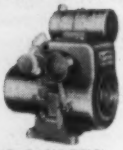
These new units are *completely Onan-built,* with Onan engines direct-connected to Onan generators in a single compact unit. The new, modern, *short-stroke,* single-cylinder, 4-cycle engines feature extra-large bearings and free-breathing intake and exhaust systems to give you thousands of hours of operation without major servicing. Generators are drip-proof and specially insulated for all-climate, all-season use.

Equipped with carrying frames or two-wheel rubber-tired dollies, Onan AJ and AK series electric plants can be taken anywhere . . . moved around easily on the job.

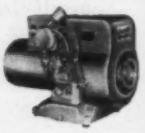
See your Onan distributor or write for new folder describing all 18 new models

POWERED BY MODERN SHORT-STROKE ENGINES

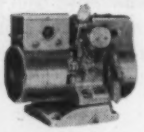
AK A.C. MODELS 500 and 750 watts, 115 or 230 volts.



AK D.C. MODELS (Battery chargers) 500 and 750 watts, 6, 12, 32 volts.



AJ A.C. MODELS 1,000 and 2,500 watts, 115 or 230 volts.



AJ D.C. MODEL (Battery Charger) 1500 watts, 32 volts

Onan ELECTRIC PLANTS

D. W. ONAN & SONS INC.

2865 University Ave. S.E., Minneapolis 14, Minnesota

the National Production Authority, Creedon was named Director of Installations for the Department of Defense in 1952.

Atlas Diesel Company, Ltd. Promotes Two Engineers

Erik Ryd of Sweden and J. A. Perham of Canada, compressed air engineers, have been assigned new posts in Atlas Diesel Company Ltd., compressed air equipment manufacturers of Stockholm, Sweden.

Ryd, best known for his pioneering work in the development of Swedish tunneling methods, has been named technical director of the Atlas organization.

His development of a successful light-weight rock drill that can be handled by one man was started in 1929 when he was head of the company's design department.

Perham's new post is that of sales director of the Atlas organization with headquarters in Stockholm. Formerly associated with the company's Canadian unit and later managing director in Britain of the Atlas Diesel Company Ltd., Perham was in charge of a team that successfully demonstrated Swedish drills on the 10-mile Alcan tunnel.

Port of New York Authority Names Donald Lowe Chairman

Donald V. Lowe, vice chairman of the Port of New York Authority for the past two years, has been elected chairman of the bi-state agency. He

(*Continued on page 94*)

D. V. Lowe

BRIXMENT

Better Mortar for Blocks

BETTER BODY

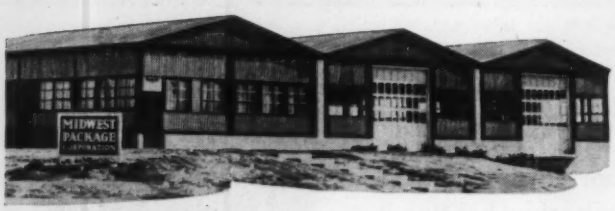
When concrete block are laid, the mortar should have "body", to support the weight of the unit, thus holding it up to the line. If the mortar lacks body, the block will settle below the line even if a thick bed of mortar has been spread.

At the same time, plasticity is required. Unless the mortar is plastic, the bricklayer cannot quickly and accurately tap the block down to the line.

Brixment has body and plasticity. It is firm but not stiff —soft but not sloppy. This combination of body and plasticity makes Brixment the best possible mortar to use with concrete blocks.

Louisville Cement Company . . . Louisville 2, Kentucky

This contractor mounts his Handy-Huts on skids and drags them to new locations on a vast construction project. The basic building is 10′ wide. Length starts at 8′ and is unlimited in 2′ multiples. Patented wedge and clip method of attachment eliminates the need for puncturing top roof or side sheets. May be dismantled many times without damage and re-erected anywhere. Use them for field offices, tool sheds, explosive storage, any of 1000 uses. You can also obtain garage doors, various door and window combinations, interior partitions, etc. Suit this Handy-Hut to your needs and save money everywhere you need a small building.



GENERAL UTILITY BUILDINGS
26′-30′-40′ SPANS

For larger requirements, check USF's larger, fully prefabricated, all-steel buildings for single or multiple use. All feature a variety of side and end treatments allowing full versatility of use. USF 40′ buildings feature rigid frame construction. Write for complete literature.

United Steel Fabricators, Inc.
WOOSTER, OHIO

succeeds Howard S. Cullman, who has assumed the newly created post of honorary chairman after serving on the authority for 28 years—10 of them as chairman.

A chemical engineer, Lowe has been active for many years in New Jersey community affairs and is president of the Lowe Paper Co. of Ridgefield, N. J. He was first appointed a port authority commissioner in 1945.

Air Pollution Post Filled By Public Health Service

The Public Health Service, Department of Health, Education and Welfare, has called Louis C. McCabe, an authority on air pollution, to active duty as a commissioned officer. Stationed in Washington, D. C., McCabe will serve as staff advisor on air pollution to Marc D. Hollis, assistant surgeon general and chief sanitary engineer.

In his new position, McCabe will be responsible for technical staff activities and program liaison with other federal agencies. A former director of the Los Angeles County Air Pollution Control District, he has been chief of the Fuel and Explosives Division of the Bureau of Mines, Department of Interior, since 1951.

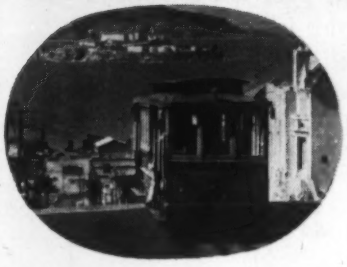
This is the bureau's second major appointment this year in the field of air pollution control. Earlier it appointed Arthur C. Stern as director of the program of air pollution research.

Men and Jobs Briefs . . .

• **Associations**—The Indiana Society of Professional Engineers installs **C. F. Falkner** of Indianapolis as president and designates **H. M. Estergreen** of Lafayette as president-elect . . . **Richard Hazen** heads up the Metropolitan Section of ASCE, embracing New York, northern New Jersey, Long Island, Westchester and Rockland counties. Holding degrees in both civil and sanitary engineering, he's a partner in the New York firm of Hazen & Sawyer.

Thomas W. Ryan, vice president and general manager of the Alton Brick Company, St. Louis, is elected president of the Unit Masonry Association of Metropolitan St. Louis . . . **Bruce L. Simpson** gets the top post in the American Foundrymen's Society—he's head of National Engineering Co., Chicago . . . The American Society for Engineering Education will move its editorial offices to the new national headquarters at the Uni-

THE RED STARS INDICATE STRUCTURES BUILT ON RAYMOND FOUNDATIONS



IN
SAN FRANCISCO BAY AREA

565 STRUCTURES *REST ON* RAYMOND FOUNDATIONS

In this aerial view of the San Francisco Bay area, notice the important part Raymond is playing in linking the Freeway with the Bay Bridge. This is just one example of the wide acceptance of Raymond's foundation construction. In this area of San Francisco alone, 14,093 Raymond piles—measuring a total of 698,895 feet—support 23 buildings and 6 bridges.

In your travels you have probably been in a number of Raymond-supported buildings, for there are hundreds of them in major cities throughout the country. Each one stands as another milestone in Raymond's fifty years of experience in solving all types of foundation problems. May we be of service to you?

THE SCOPE OF RAYMOND'S ACTIVITIES...

IN THIS COUNTRY

FOUNDATIONS . . . MARINE STRUCTURES . . .
HEAVY CONSTRUCTION . . . SOIL INVESTIGATIONS.

OUTSIDE THE UNITED STATES

COMPLETE SERVICE FOR ALL TYPES OF CONSTRUCTION.

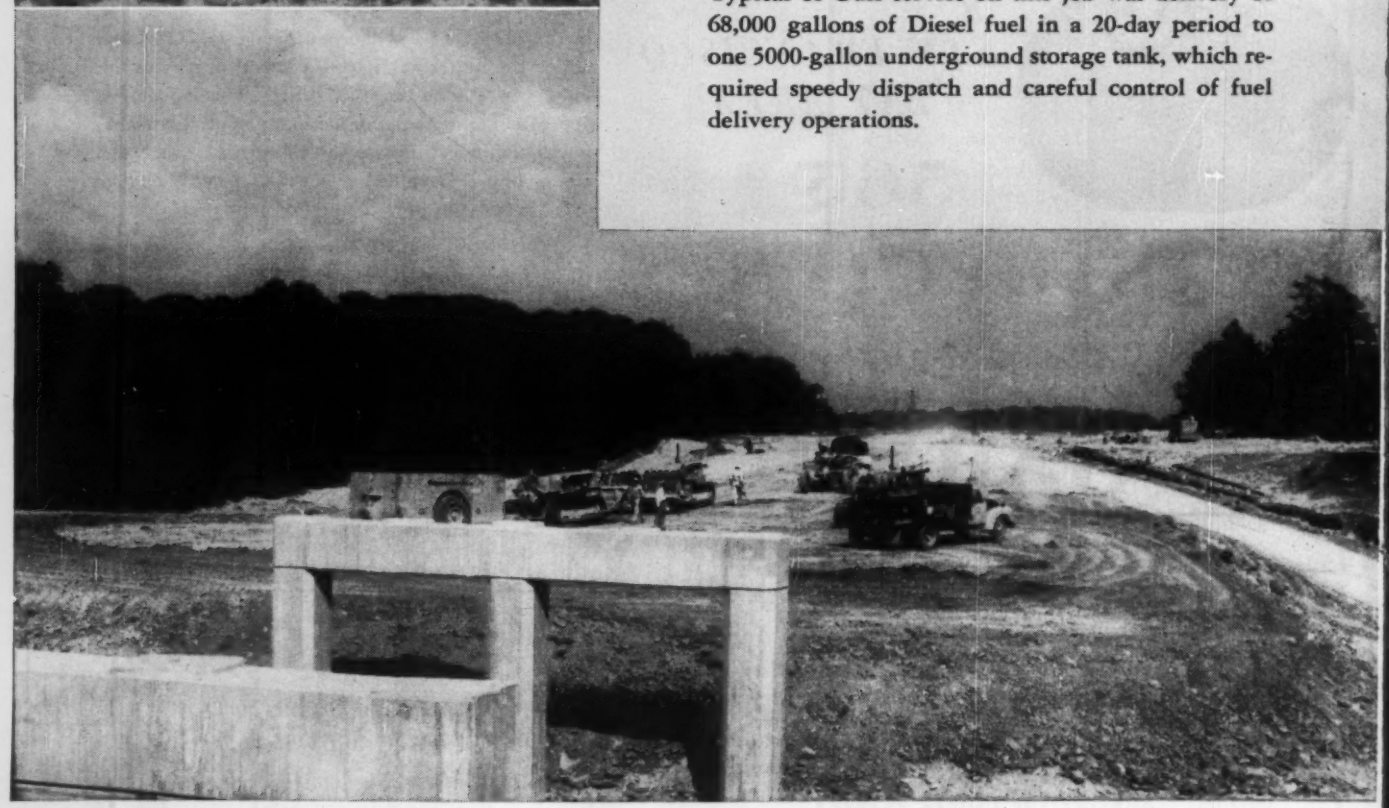
RAYMOND
CONCRETE PILE CO.
140 Cedar Street, New York 6, N.Y.

Branch Offices in Principal Cities of the United States, Canada, Central and South America

AROUND THE WORLD · FOUNDED 1897 ·

GULF PRODUCTS

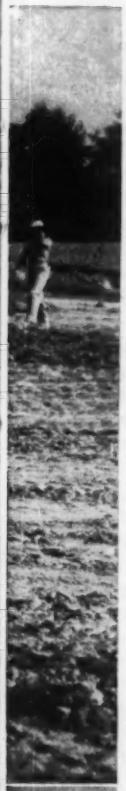
Peter Kiewit Sons' Company and Condon-Cunningham Company have the contract for Sections C-20 and C-21 of the Ohio Turnpike, which comprises 6.2 miles between Strongsville and Olmsted Falls, Ohio. Work involves moving over 1,000,000 cubic yards of dirt, with extremely poor soil conditions. Typical of Gulf service on this job was delivery of 68,000 gallons of Diesel fuel in a 20-day period to one 5000-gallon underground storage tank, which required speedy dispatch and careful control of fuel delivery operations.



and **FINE SERVICE**

keep equipment rolling

on the Ohio Turnpike Project



The Ohio Turnpike is another huge and important project where a large percentage of the participating contractors rely on Gulf to keep their equipment operating efficiently.

Contractors like Peter Kiewit Sons' Company and Condon-Cunningham Company, for example, appreciate the clean-burning, high-performance properties of Gulf gasoline and Diesel fuels—as well as Gulf's prompt delivery service.

Let us discuss with you how Gulf quality products and fine service can help on your next job. They are quickly available to you through more than 1400 conveniently located warehouses.

GULF OIL CORPORATION • GULF REFINING COMPANY
1822 Gulf Building Pittsburgh 30, Pennsylvania

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

4-IN. "X" ROK-BITS®

. . . AGAIN . . .

LOWER DRILLING COSTS

on difficult highway widening job

Faced with several hard-rock cuts of nearly 60 ft. deep the contractor decided to blast in two economical lifts; instead of several smaller ones. Jack Lynch of Rowe Contracting used big, 4-in. "X" Rok-Bits—fitted to 1½-in. steel—on a special Rowe self-propelled rig to drill the 30-ft. deep blast holes in less than two hours. Find out how you can get more footage, safeguard your profit margin, by drilling with Rok-Bits. Write plant nearest you.

Contractor: Rowe Contracting Co., ▶ Malden, Mass.—one of the first in the country to design rigs to handle 4" bits.

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MEN AND JOBS

versity of Illinois July 1, when **Lisle Rose**, professor of general engineering, will succeed **Clarence Watson** as editor.

• **Careers—Sterling St. John, Jr.**, a pioneer in the establishment of the Foreign Trades Zone Board and now a port and foreign trade consultant in Washington, D. C., is appointed executive director of the Port of Detroit . . . **Harold E. Lorton** takes over as acting city engineer, Springfield, Ohio . . . **T. Yancey Milburn**, Durham, N. C. civil engineer becomes industrial consultant to the Durham Committee of 100 for industrial development . . .

Albert Goodwin, engineer in charge of the U. S. Geological Survey offices in Ashville, N. C., is named project manager of the South Atlantic and Eastern Gulf States region—he'll still retain the Ashville assignment . . . **Charles B. Berry** will give up the post of director of public works for Denver, Colo.,—which he's held since 1947—on July 1. He was formerly president of Hamilton & Gleason, heavy engineering contractors.

• **Business—Thomas A. Berrigan** returns to the private practice of law and engineering, after serving as director and chief engineer of the Metropolitan Sewerage Works in Boston, Mass., with which he's been associated for the last 20 years. During World War II, he served as assistant public works officer of the First Naval District and was appointed a member of the National Water Pollution Control Board in 1949.

Irving B. Rau opens his office for the practice of civil and structural engineering in New Orleans . . . **Roy F. Vanek** becomes an associate in Stanley Engineering Company, consulting engineers in Muscatine, Iowa, and will continue his work on power projects in the middle west . . . **John K. Metzger** is elected executive vice president and general manager of Metzger Construction Corporation, Buffalo, N. Y. Formerly vice president, he's been with the company 20 years.

Jack B. Graham becomes a partner in the firm of Leggette, Brashears & Graham (formerly Leggette & Brashears), New York consulting groundwater geologists—he was a groundwater geologist with the U. S. Geological Survey before coming to the firm last year . . . **William A. Fisher**, former general manager of

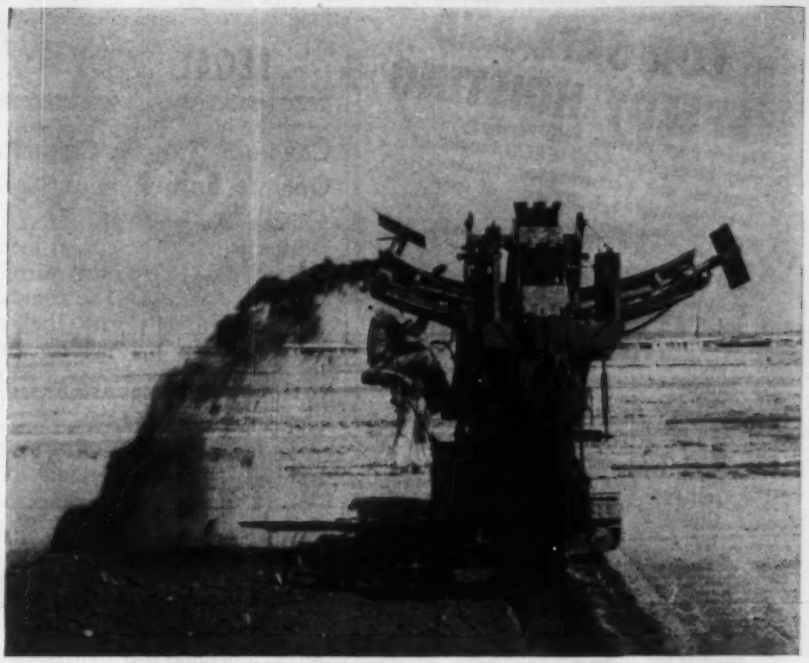
the Boston office of Charles A. Maguire Associates, Providence, R. I., engineering firm, establishes his own practice under the name of William A. Fisher Company, Inc., in Boston—he has served as traffic commissioner for Boston and has been active in bridge and highway work.

• **Education**—Next fall, **Pier L. Bargellini,** University of Pennsylvania scientist, will receive a fellowship established by United Engineers and Constructors, Inc. at the University's Moore School of Electrical Engineering. It wil be used for completion of a book on "Information Theory" based on a study of high-speed communications . . . Clarkson College of Technology, Potsdam, N. Y. will hold its fourth annual summer forum for science and mathematics secondary school teachers in July to acquaint them with the facilities and objectives of an engineering college.

The engineering building at Kansas State College is named Seaton Hall in honor of **Roy A. Seaton,** dean emeritus of the School of Engineering and Architecture. Seaton's been associated with the school since his graduation in 1904 and holds the Lamme Medal, awarded by the Society for Promotion of Engineering Education for outstanding achievement in his field . . . Furman University, Greenville, S. C., names **Carl H. Clawson** resident engineer for its current $15-million building program.

• **Honors**—For his engineering achievements and particularly for his direction of the design of the New York Central Railroad vertical lift bridge over the Harlem River in New York, the Metropolitan New York Section of ASCE—names **Shortridge Hardesty,** partner in the firm of Hardesty & Hanover, New York, as Metropolitan Area Engineer of the Year (1954) . . . **Frank Lloyd Wright,** architect and onetime civil engineering student at the University of Wisconsin, will be awarded an honorary degree of doctor of fine arts at the University's commencement exercises this month.

For his contributions to the building industry, **Cecil C. Wainwright,** president of Wainwright Building Industries, Jacksonville, Fla., and past president of the Jacksonville Homebuilders Association, is elected an honorary member of Sigma Lambda Chi by the University of Florida . . . **Philip H. Edwards,** special assistant to the director of tunnels and bridges, Port of New York Authority, receives the authority's distinguished service medal on his retirement after 28 years of service.



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LEGAL

Contract Can Be Cancelled Only If Both Parties Agree

Once a contract is entered into, neither party can rescind it merely by giving notice to the other party of his intention to do so. The contract can be rescinded only with the consent of both parties and such consent may be shown by the acts or conduct of the parties as well as by written or oral agreements.[1]

In this case, after the contractor had been retained to build an addition to an existing building and had performed some work on the job for which he had been paid, the owner stopped the work and the contractor then brought an action to recover damages for breach of contract. The owner's defense was that he had notified the contractor of his election to rescind the contract. The court found as a fact that the work was stopped without the contractor's consent. Under such circumstances there could be no rescission of the contract. The contractor was given judgment for his damages.

[1] Warren v. Gray, 83 S.E. 2d 86, Court of Appeals of Georgia, July 12, 1954.

Architect's Compensation

An architect was employed to prepare plans and specifications and render other services in connection with the development of a building project. He was to receive a fee of $15,000, 20% of which, or $3,000, was payable upon completion of the plans and specifications. The architect was paid $1,500 on account. The project was abandoned because its promoter was unable to finance it. No further payment was made to the architect who brought an action to recover $1,500, the balance he claimed was due for preparing the plans and specifications. The court allowed the architect a recovery holding that under the agreement he was entitled to $3,000 whether or not the promoters went through with the project.[1]

[1] Douglas v. Nowakowski, 106 A. 2d 468, Supreme Court of Errors of Connecticut, July 7, 1954.

No Contact Until Offer And Acceptance Coincide

"To constitute a contract by offer and acceptance, the acceptance must conform exactly to the offer, and, although a reply to an offer purports to accept the offer, it is not an acceptance, but a counter offer and does not create a contract, where it adds qualifications and requires the performance of new conditions. Worley v. Holding Corp., 348 Ill. 420, 181 N.E. 307. A letter written in reply to an offer but with some variations, though slight, cannot be regarded as the consummation of a contract, and requires an acceptance upon the terms thus stated, and until unequivocally accepted is a mere proposition or offer. Maclay v. Harvey, 90 Ill. 525."[1]

The court also stated: "One to whom an offer is made must either accept or reject it and if he does not accept it he necessarily rejects it. If he introduces a new term into the offer, he in effect offers a counter proposal."

Illustrating this principle of law is a case[2] where a subcontractor submitted an offer to do part of the general contract work. After the general contractor had been awarded the contract, it submitted a proposed contract to the subcontractor which included work not included in the bid of the subcontractor and for which no extra payment was provided. The subcontractor then notified the general contractor that it was no longer interested in the job. Upon the refusal of the subcontractor to execute the contract, the subcontract was awarded to another contractor at a larger price and the general contractor then brought an action against the original subcontractor.

The general contractor was denied a recovery, the court holding that since the written contract submitted to the original subcontractor contained requirements not contained in the original offer, the submission of the contract was in fact a rejection of the original offer, constituting a counter offer and giving the subcontractor a right to withdraw its bid.

[1] Krause v. Buttino, 123 N.E. 2d 337, Appellate Court of Illinois, Dec. 15, 1954.
[2] R. J. Daum Const. Co. vs. Child et al, 247 P. 2d 817.

Clauses in Subcontracts Should Be Double-Checked

In an action brought by a subcontractor to recover a sum claimed to be due for work done, the prime contractor counterclaimed for liquidated damages he said he had to pay as a result of delays in the work caused by the acts of the subcontractor. The subcontract, prepared by the prime contractor, provided that the prime contractor would "make no demand for liquidated damages or penalty for delay in any sum in excess of such amount as may be specifically named in the subcontract."

(*Continued on page 102*)

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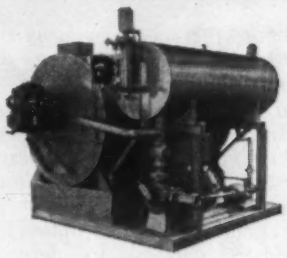

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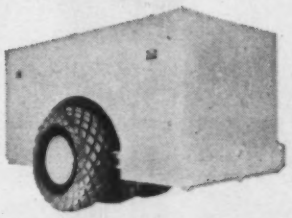

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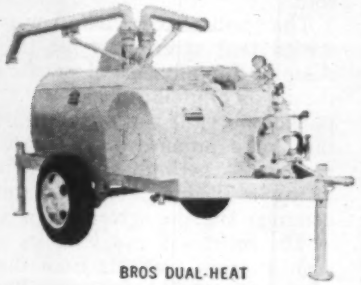

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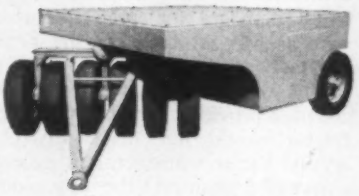

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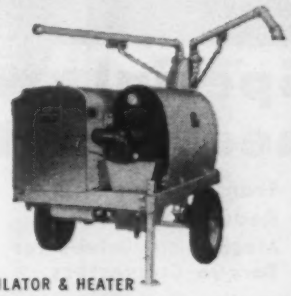

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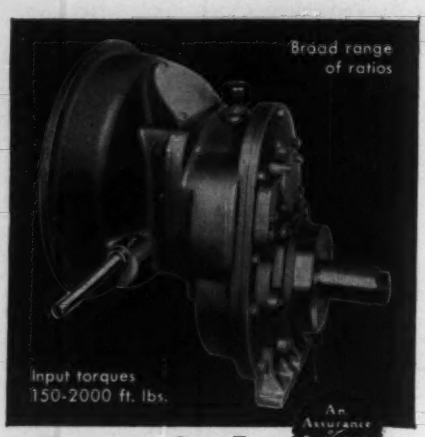

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Before the subcontract was signed, there was no discussion as to the amount for liquidated damages to be fixed in the subcontract and the subcontract did not fix any such sum. After the subcontract was executed, the general contractor informed the subcontractor that, in view of the fact the general contract provided for liquidated damages for delayed performance and the general terms of the general contract were incorporated into the subcontract by reference, the subcontractor was liable to the prime contractor for the amount of liquidated damages for delayed performance as was set forth in the general contract.

The court held that since the subcontract provided that the prime contractor would not make any claim against the subcontractor in excess of a specified amount, the provision in the general contract for liquidated damages did not apply to the subcontract. The failure of the general contractor, who prepared the subcontract, to fix the amount of liquidated damages the subcontractor might be liable for precluded the prime contractor from recovering.[1]

In interpreting the contract, the court relied on the following rules of law: "Where the language of a contract is free from ambiguity, it must be construed by the Court according to its obvious meaning. * * * The contract is to be considered as a whole. * * * Clauses in a contract dealing specifically with a particular subject matter prevail over general clauses which might, in the absence of the specific clause, lead to another construction. * * * And, any doubt as to the meaning or construction of a contract should be resolved against the party who prepared the contract. * * *

[1] United States for use and benefit of Commercial Equipment Co. v. Wooten et al., 121 F. Supp. 130, U. S. District Court, May 7, 1954.

Can't Recover Money Paid To Get Public Contracts

A contract to pay money to a person for the purpose of exercising political influence in order to get government contracts is against public policy and illegal and therefore will not be enforced.

In a recent case,[1] a party made a substantial contribution to a campaign fund in reliance upon the representation of the party to whom the contribution was given that he was in control of the political party to which the contribution was made and also knew powerful influences in both parties. He agreed that if the contribution was made, he would see to it that the giver would get contracts from various branches of the state and county institutions. The party to whom the money was paid failed to deliver any contracts and the giver of the contribution brought an action to recover the money donated. The court denied him recovery, holding that since the contract was one to influence public officials in the performance of their duty, it was against public policy and void.

The court stated: "The law is well settled that agreements for the purchase of the influence of private upon the action of public officials are against public policy. If part of the consideration for a promise or any part of a promise to perform an entire undertaking is illegal either by statute or common law the agreement is void."

The court will not lend its aid in such a claim. Quoting from the case of the First Trust & Saving Bank of Kankakee v. Powers, 393 Ill. 97, 65 N.E. 2d 377, the court further stated: "The rule of public policy that forbids an action for damages for breach of such an agreement is not based on the impropriety of compelling the defendant to pay damages. That in itself would be a desirable thing. When relief is denied it is because the plaintiff [the party bringing the suit] is a wrongdoer, and to such a person the law denies relief. Courts do not wish to aid a man who founds his cause of action based upon his own immoral or illegal act."

[1] Kilian v. Frazier, 123 N.E. 2d 592, Appellate Court of Illinois, Dec. 29, 1954.

How Do You Prove Cost In Cost-plus Contracts?

A contractor brought an action to recover a balance allegedly due for work done under a cost-plus contract. The owner entered a counterclaim for damages which it claimed resulted from the builder's malfeasance, extravagance, wastefulness and negligence.

The builder offered evidence to show that he had actually expended the amounts listed as the cost of the items charged. This testimony was not contradicted by the owner. The court found in favor of the contractor, holding that the burden of proof was on the owner to establish his damages even though there was a marked disparity between the builder's estimate and the actual cost of the structure. In absence of such proof the contractor was entitled to recover the cost of the work plus the stipulated fee.[1]

The court stated: "There is no prin-

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ciple in the law that one who contracts to do certain work for another must disprove his default as a part of his affirmative case for compensation. In fact the opposite must be the general rule. Honesty and good faith are always presumed, 17 Ohio Jurisprudence 112, Section 89; fraud is not presumed, 17 Ohio Jurisprudence, 113, 143, Sections 91 and 114; negligence is not presumed, 17 Ohio Jurisprudence, 158, Section 124; and performance of duty is presumed, 17 Ohio Jurisprudence, 98, Section 77."

It is only "when the owners produce evidence of such a character as to raise a presumption of negligence or default on the part of the builder, that the latter will be required only to produce evidence sufficient to balance the state of proof. Tresise v. Ashdown, 118 Ohio State 307, 160 N.E. 898, 58 American Law Reports 1476."[1]

In this case, the court held that in the absence of proof to the contrary, the contractor's evidence of the actual cost of the work was sufficient and the law did not impose any obligation on him to show an absence of unnecessary increase in the work's cost.

Similarly where actions are brought to recover for damages done to a building, the actual cost of making the pairs is accepted as evidence of the cost of the repairs.

[1] Charles A. Burton, Inc. v. Durkee et al., 123 N.E. 2d 432, Supreme Court of Ohio, Dec. 22, 1954.

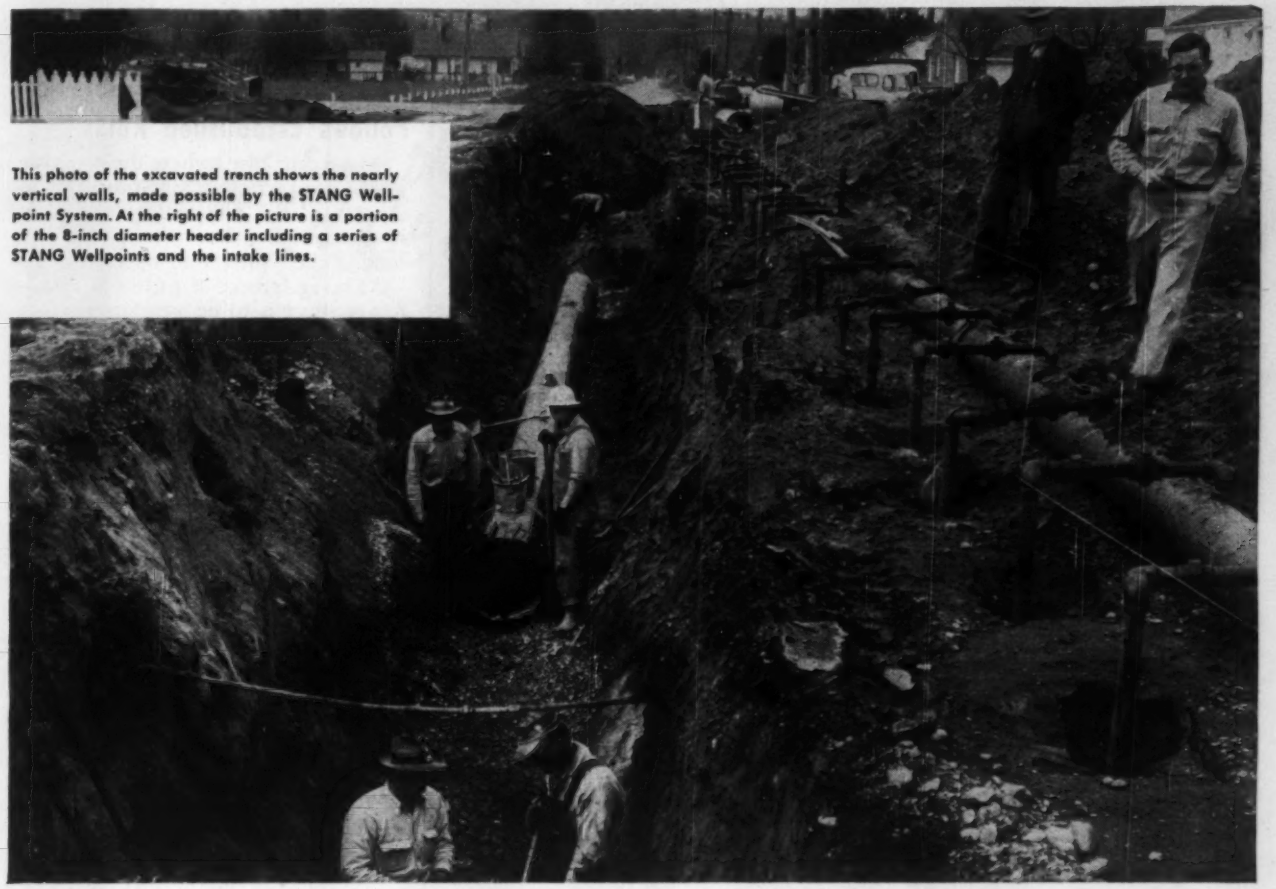
Owner Has Prior Interest in the Amount He Retains

A construction contract contained the usual provision for the retention of part of the contract price until all claims for work done and materials furnished had been discharged. The court[1] held that the contract provision was made for the benefit of the party for whom the work was being done and not for the benefit of laborers, materialmen or subcontractors and did not give such parties any rights to the fund so retained.

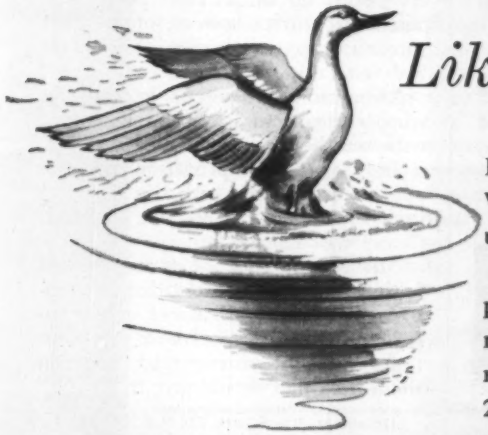
In this case, a materialman brought an action against the owner to recover an amount due him for materials furnished to the contractor, claiming that the retained money was for the purpose of securing payment for materials furnished for the job. The claim was dismissed, since the contractor had abandoned the job before completion. After other contractors were employed to complete it, there was nothing left of the retained percentage fund.

[1] Houston Shell & Concrete Corp. v. Minnella, 269 S.W. 2d 953, Court of Civil Appeal of Texas, July 8, 1954.

(Continued on page 106)



This photo of the excavated trench shows the nearly vertical walls, made possible by the STANG Wellpoint System. At the right of the picture is a portion of the 8-inch diameter header including a series of STANG Wellpoints and the intake lines.



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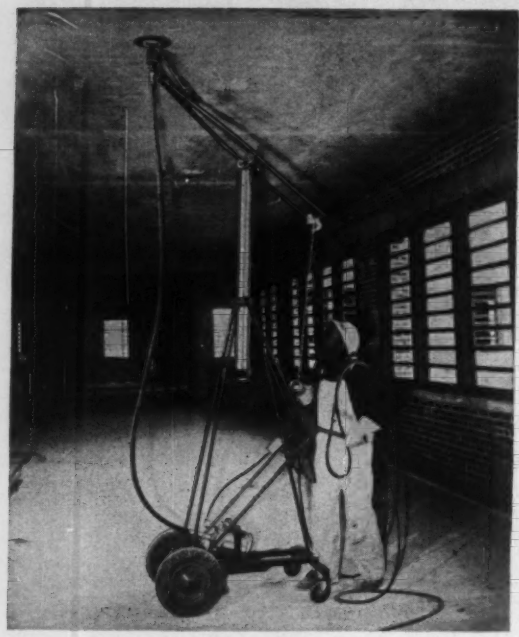

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LEGAL

Construction of Contracts Follows Established Rules

In a recent case,[1] where the meaning of a contract was questioned, the court used the following rules of law in determining how the parties intended the contract to operate;

"The agreement of parties to a written contract is to be ascertained from the language of the instrument, and there can be no intendment or implication inconsistent with the express terms thereof.

"Except where the reformation of a written contract is sought in equity, evidence cannot be introduced to show an agreement between the parties materially different from that expressed by clear and unambiguous language of the instrument.

"The intent of the parties controls in the interpretation of the contract and the intention must be gathered from the language employed.

"The function of a court is to interpret and enforce contracts and not to make or extend them.

"Where a written agreement is plain and unambiguous it does not become ambiguous by reason of the fact that in its operation it will work a hardship on one of the parties thereto and corresponding advantage to the other.

"Courts do not relieve a party competent to contract from an improvident agreement in the absence of fraud or bad faith.

"A person competent to contract who, pursuant to a written agreement with another has performed services, is entitled to compensation therefor only in accordance with the terms of such bargain, in the absence of fraud, illegality or bad faith.

"In the absence of fraud or bad faith, a person is not entitled to compensation on the ground of unjust enrichment if he received from the other that which it was agreed between them the other should give in return."

[1] Gillette v. Brookhart, 123 N.E. 2d 693.

Substantial Performance

Ordinarily, there can be no recovery for work done under a construction contract unless there has been substantial performance. "It is elementary law that 'there is an obligation to perform substantially a building or construction contract according to the terms of the agreement before a party can have a right of action.' 9 American Jurisprudence, 22, Building and Construction Contracts, Section 31."[1]

However, in some states like Louisiana, local statutes permit a contractor to recover for work done even though

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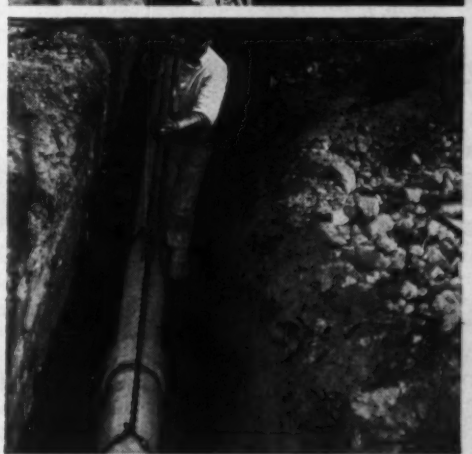

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the contract has not been substantially performed. Thus in a recent case,[2] the court in its opinion stated: "The jurisprudence is well settled in this state that a contractor may recover the value of the work done by him if a price has been agreed upon even though it be unfinished or defective, the remedy of the owner being a reduction of the contract price by an amount necessary to perfect or complete the work according to the contract. Peterson v. Peralta, 3 La. App. 516; Reimann Const. Co. v. Upton, La. App., 178 So. 528; Merrill v. Harang, La. App., 198 So. 368; Brandlin Slate Co. v. Bannister, La. App., 30 So. 2d 877."

[1] Magee v. I. & G. N. Wood & Coal Co., 269 S.W. 2d 498.

[2] Spicuzza v. Ranzino, 73 So. 2d 208, Court of Appeals of Louisiana, June 7, 1954.

Contractor Can Collect If Owner Causes Default

"A contractor may sue on the contract though he has only partially performed his undertaking, where full performance is prevented by the wrongful act of the owner, or where the owner is guilty of a breach which justifies the contractor in refusing further performance or where the contract provides that if the work is not completed the contractor shall be entitled to the contract price less such amount as may be reasonably necessary to complete the building according to the plans and specifications."[1]

In the above case, the owner refused to permit the contractor to complete the work before the extended date for completion. The contractor brought the action to recover the contract price less the cost of completing the work and was allowed a recovery.

[1] Sullivan v. Dubis, 271 S.W. 2d 316, Court of Civil Appeals of Texas, July 29, 1954.

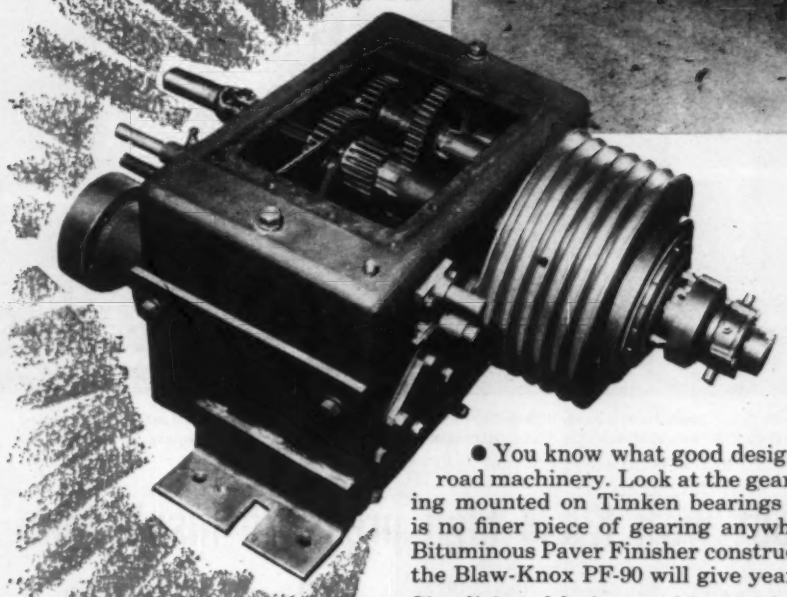
Cost-plus Contracts

Where the contract provides that the contractor will be paid the cost of labor and materials used in the work plus a certain percent for profit, the contractor cannot include the cost of supervising the work as an element of cost. "This point was recently determined by this court in Grothe v. Erickson, 157 Neb. 248, 59 N.W. 2d 368. To hold otherwise would in effect allow a double payment for the same service."[1]

[1] Timmons v. Nelson, 66 N.W. 2d 406, Supreme Court of Nebraska, October 8, 1954.

(These summaries of court decisions are prepared by J. Vernon Werbin, New York attorney and civil engineer.)

the BLAW-KNOX —a BETTER BUILT *Bituminous Paver*



It is only a matter of minutes to increase or reduce screed and tamper extensions for wider or narrower pavements—just bolt on the extensions—no complications. Here a Blaw-Knox PF-90 is laying a narrow course on a street job.

● You know what good design and construction means in a piece of road machinery. Look at the gear case above. Cut gears on splined shafting mounted on Timken bearings and all running in an oil bath. There is no finer piece of gearing anywhere. This is typical of the Blaw-Knox Bituminous Paver Finisher construction. It is a part of your assurance that the Blaw-Knox PF-90 will give years of service without rebuilding.

Simplicity of design combines with precision manufacture to make upkeep and operation easy. Timken bearings (91 of them) are used wherever good engineering indicates they can be advantageously applied. They cut power requirements and simplify lubrication. The addition or removal of screed sections and associated parts for wider pavements is a matter of minutes with few parts.

But, most important of all is the simplicity and better design inherent in wheel operation. Wheel operation and pneumatic tires eliminate the 500 to 700 parts characteristic of crawlers with all their attendant upkeep problems. Wheel design assures more accurate control. Pneumatic tires absorb vibration and subgrade irregularities and combine to make it possible for the PF-90 to outproduce any black top paver on the market today. Some of the country's leading contractors are replacing or adding to their present equipment by purchasing the Blaw-Knox. You owe it to yourself to find out about the PF-90.

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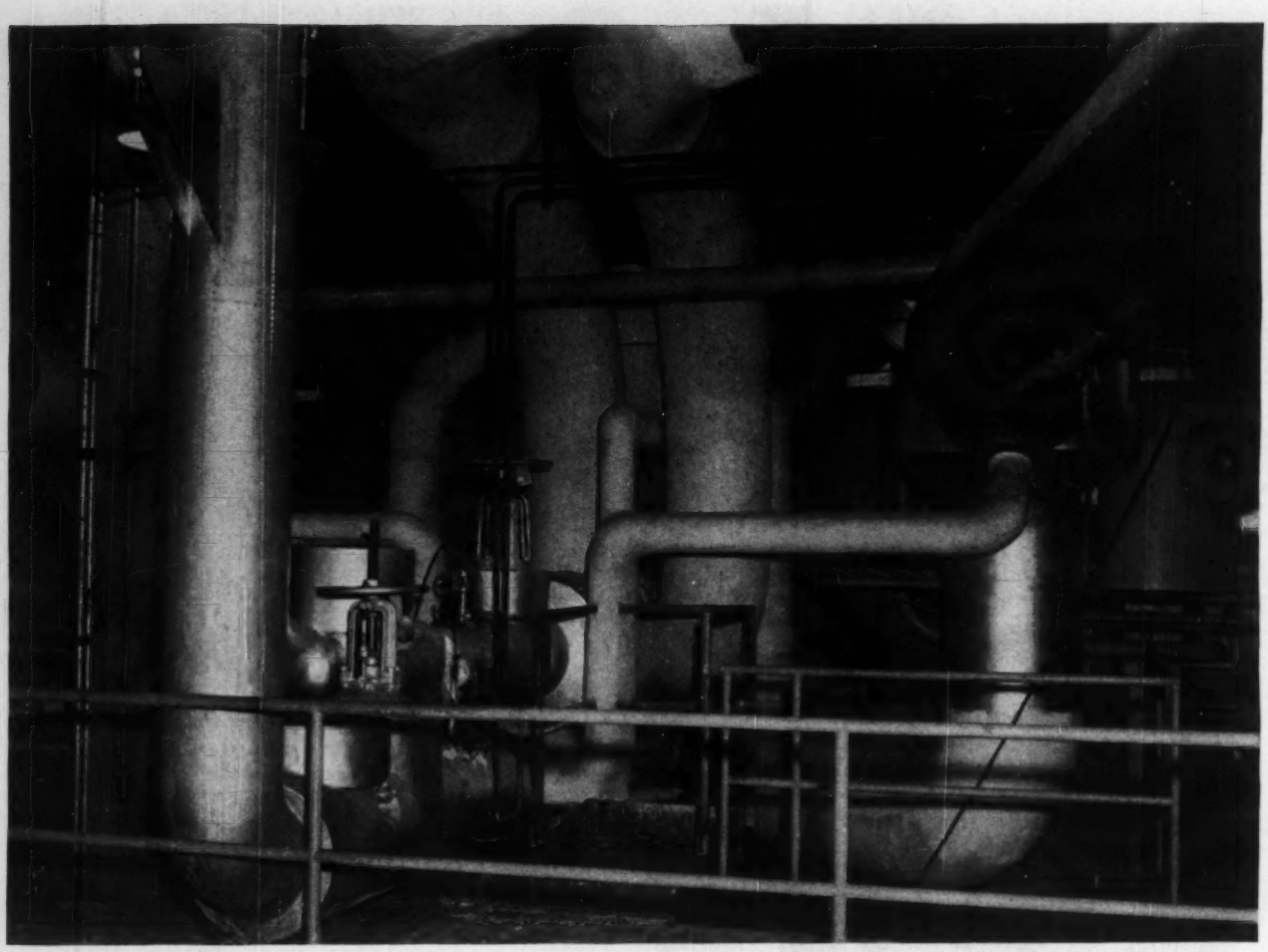

A COMBINATION INSULATION. A 2 inch thickness of K&M Hy-Temp, together with a 2 inch thickness of K&M "Featherweight" insulates the pipe and main throttle valve shown. This equipment at the Meramec Power Plant, Union Electric Company of Missouri, St. Louis, operates at 950°F. Insulation Contractor: Armstrong Cork Company.

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BOOKS

Materials Handling

CONVEYORS AND RELATED EQUIPMENT—Third Edition. By Wilbur G. Hudson. 524 pp. John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. $9.00.

The words "and Related Equipment" in the title of this book covers an unexpectedly wide area, which includes rock-crushers and pulverizers, screen, bins and bin gates, also bunkers, all of which are of interest to people in the construction field. Equipment for handling and storing coal and ashes at power plants also is included.

Because of the breadth of the field of materials handling, the author has undertaken to confine his discussion to problems more commonly met. He has endeavored also to meet both the needs of students as well as those of men of wider experience. To this end, he has stressed the limitations of each type of conveying equipment as well as its advantages.

New Engineering Books

AUTOMATIC TRANSMISSION—By The Instructional Staff, Commercial Trades Institute, Chicago, Illinois, 406 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $6.50

MOVING THE EARTH: THE WORKBOOK OF EXCAVATION—By Herbert L. Nichols, Jr., 1,280 pp. North Castle Books, 212 Bedford Rd., Greenwich, Conn. $15.00

FLOODS—By William G. Hoyt & Water B. Langbein, 468 pp. Princeton University Press, Princeton, N. J. $7.50

Report and Pamphlets

DESIGN OF BARREL SHELL ROOFS—Portland Cement Assn., 33 W. Grand Ave., Chicago 10, Ill.

PANAMA RAILROAD:1855-1955—The Story of the First Trans-Continental Railroad—by R. W. Hebard. The Panama Railroad Co., Washington, D. C.

FIRE TESTS OF BRICK WALLS—BMS Report 143, National Bureau of Standards. Superintendent of Documents, Washington 25, D. C. $0.35

STRAIGHT DROP SPILLWAY STILLING BASIN—Technical Paper No. 15, Series B, St. Anthony Falls Hydraulic Laboratory, Minneapolis, Minn.

WHAT PRICE FEDERAL RECLAMATION?—By Ramond Moley. American Enterprise Assn., Inc., 1012 14th St., N. W., Washington 5, D. C. $1.00

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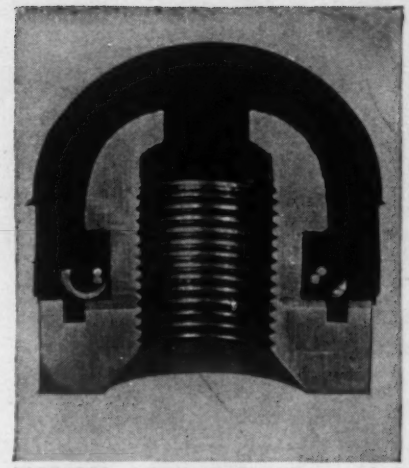


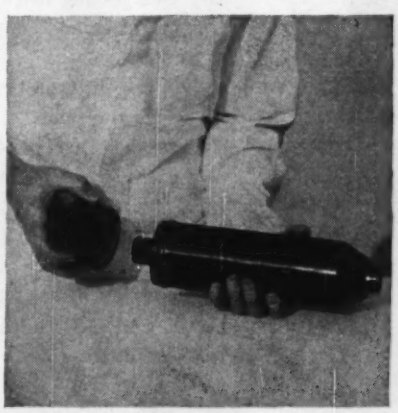
TOUGH, LIVE RUBBER molded on Viber replaceable tip prevents vibrator damage to costly forms.

COILED SPRING around steel base firmly anchors rubber molded completely through and around tip.

Replaceable rubber tips save contractors thousands of dollars

● Progressive contractors save thousands of dollars by using rubber tipped vibrators to eliminate damage to forms of plywood and other expensive materials. This means longer form life and less cleanup time. Another important saving is longer housing life because the housing is subject to very little wear, and the tip (where most wear occurs) may be replaced when necessary.

Five years of successful field experience have proved that VIBER'S exclusive patented replaceable rubber tips will stand up under rigorous field conditions. As the result of such experiences, leading contractors like the Robert E. McKee Company have standardized on and use rubber tipped vibrators.



VIBER HOUSINGS LAST two to four times longer because of replaceable rubber tip, which screws on end of housing where most wear occurs. Rubber tip vibrators are available from 1-5/16 inch to 3 inch diameter.

● Simple design of Viber's patented replaceable tip combines a machined steel base and a molded rubber body. The base, as illustrated above, provides a positive attachment and mechanical interlocking of the two parts. This prevents any possibility of the rubber coming off in the field until it is literally torn and shredded away by reinforcing steel or the abrasive action of the concrete itself

The machined steel base screws directly on the lower end of the housing. It is designed with the same outside diameter as the housing, so the complete assembly is perfectly smooth and will not catch or hang up in the form.

The vibrator does not lose any effectiveness when the rubber finally wears off, since vibration comes from the sides of the housing Replacement of tip requires only long enough to unscrew the old tip and screw on a new one.

● These patented replaceable rubber tips are another example of the progressive design and planning which keeps Viber a leader in the field of vibration. For information on Viber's complete line of internal and external vibrators, contact your authorized distributor or VIBER COMPANY, 726 South Flower Street, Burbank, California. Dept. 76

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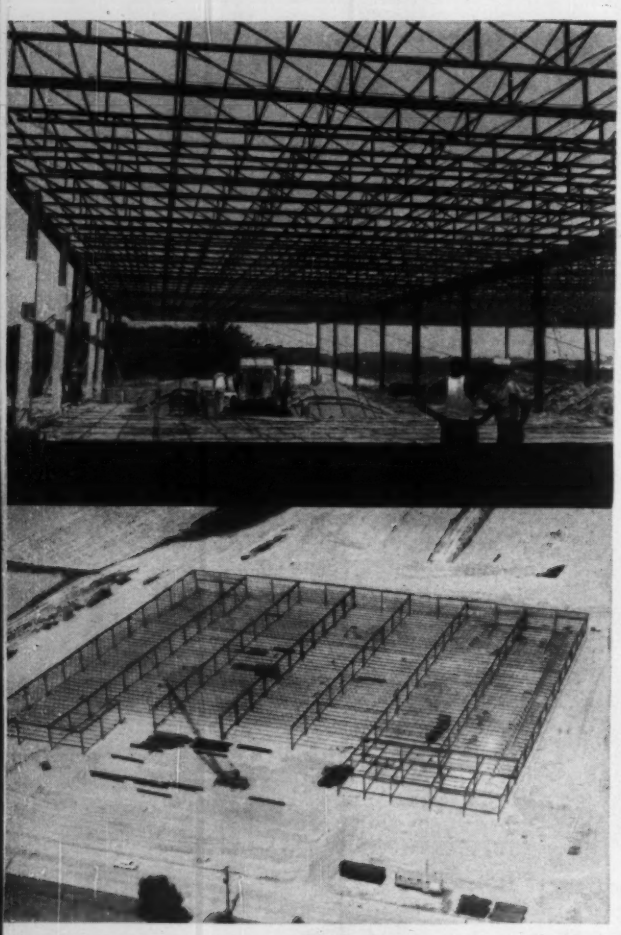
Underside view of the Longspan Open-Web Steel Joist construction shows typical bay in new Crown Cork & Seal Company plant.



This is the factory portion, with the last of the Ceco Longspan Open-Web Steel Joists being erected.

Cans—cans—cans—thousands upon thousands for motor oil, beer, soft drinks and frozen foods. That's the kind of expanding market that made speed imperative in new plant construction for Crown Cork & Seal Company, Inc. But there was a practical problem—how to span 30′ x 60′ bays without overspending. So several methods of framing were studied. Ceco Open-Web Steel Joist construction proved to be the answer for both economy and speed.

For the factory, Ceco Open-Web Longspan Steel Joists were indicated . . . for the office portion, Open-Web Standard Steel Joists were the ticket. The advantages:

1—Steel Joists were quickly lifted, spaced and anchored . . . the Longspans taking only 5 days, the Standards just a few days longer.

2—Steel Joist design showed a 10% saving over other steel constructions.

Building height was kept to a minimum, and necessary clear ceiling height maintained, because sprinkler system, mains and conduit were run *through* the joist webs.

"We are enthusiastic over the speed with which the whole job was done," said Jack Lotz, contractor. "The right product, plus good planning, was the answer. Ceco deliveries were timed to avoid double handling on the job."

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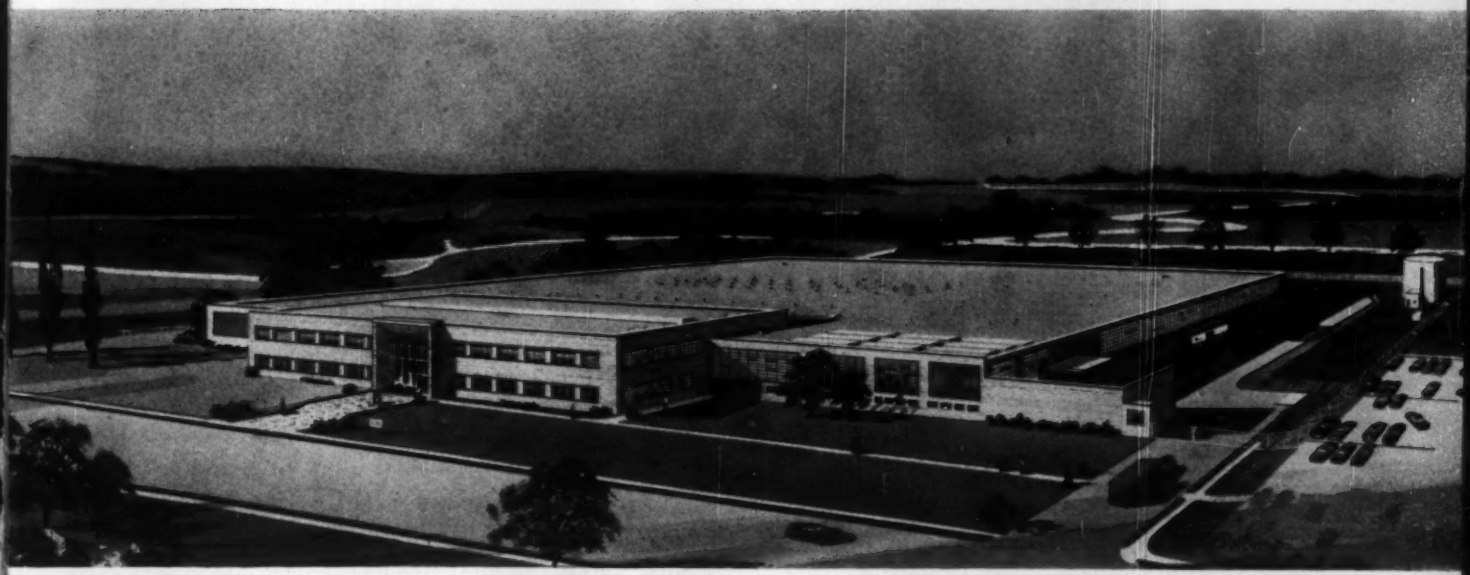
IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

Speed of erection cuts labor costs. Inch-long weld on each side of bearing plate secures joist. Bolted connection or beam anchors are alternate methods. Each joist is tagged with identifying code number.



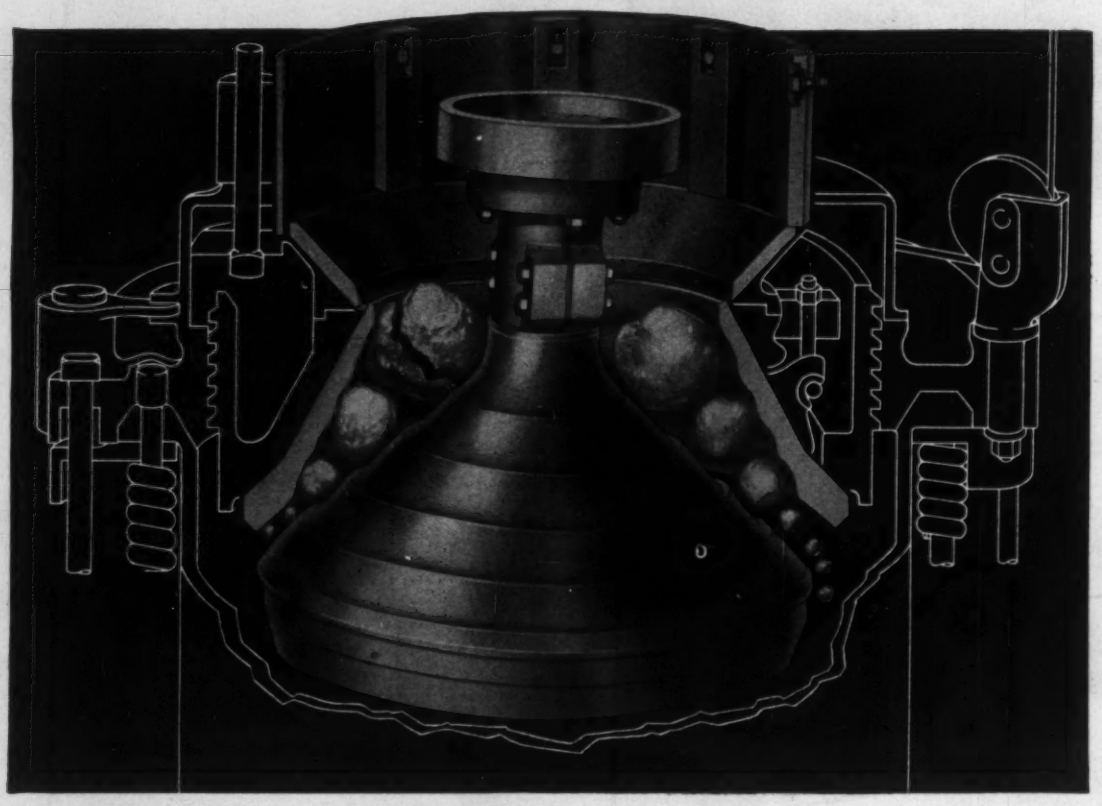
General office and factory of Crown Cork & Seal Company, Inc., Northeast Philadelphia, Pa. / 405 tons of Ceco Steel Joists. / Contractor: William F. Lotz, Inc.

Open-Web Steel Joists provide the lightest standard fire-resistive construction—are speedily placed—allow quicker occupancy of factories, commercial buildings, schools, hospitals and apartments.

AMSCO® CRUSHER PARTS

"give" a little to

TAKE MORE PUNISHMENT



Amsco crusher parts are made of the toughest steel known—manganese steel. Typical of the Amsco line are the mantle and bowl liner in this sketch of a Symons® Cone Crusher. Symons is a registered trademark of Nordberg Manufacturing Company.

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TO AMERICAN BUSINESS...

Thanks for Taming a Wild Horse

This is a message of appreciation to American industry. The occasion for the message is the completion of our eighth annual McGraw-Hill Survey of Business' Plans for New Plants and Equipment.

To a considerable degree, our appreciation is personal. It goes to the companies whose cooperation made our survey possible. Twice as many companies as in any previous McGraw-Hill annual survey carefully answered our questions about their plans to invest in new producing facilities. They gave a great deal of expensive time to the job. The cooperation of these companies, which employ nearly eight million workers, put the results of our survey on the firmest footing, in terms of coverage, it has ever had. For this cooperation we are most grateful.

But our appreciation is much more than personal. It extends in even greater degree to the kind of planning of investment in new plants and equipment which our survey revealed. The nature of this planning holds out promise that American industry is on the way toward bringing under control what historically has been one of the most upsetting forces in the American economy—the violent fluctuations in business capital investment. Progress in ironing out these fluctuations gives occasion for public gratitude.

A full report of the results of the eighth annual McGraw-Hill Survey of Business' Plans for New Plants and Equipment will be sent to anyone requesting it from the Department of Economics, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 36, N. Y.

Very Good Business News

The part of our surveys that attracts the widest interest is the news they give about immediate business prospects. And this year the news is very good. The survey results indicate that American business as a whole plans to invest $29.5 billion in new plants and equipment this year. That is 5% more than was invested last year, and a new high for any year.

Plans for the years 1956-1958 are also remarkably encouraging in terms of the amount of investment in prospect. American business reports that it is already planning to spend within 3% as much for new plants and equipment in 1956 as in 1955. In the past, the expenditures planned for future years have always been sharply lower than those planned for the current year. This is understandable enough. It is sometimes impossible to anticipate all the expenditures that will be necessary a year or more hence. Thus the fact that plans are already made

to spend almost as much in 1956 as this year is very good news about business prospects. The level of investment now planned for the years 1957 and 1958 is also remarkably high—far higher than ever reported for years that far ahead in previous McGraw-Hill surveys.

Taking the Long View

The fact that these plans exist is of immense constructive significance. It clearly indicates that more and more, and now in dramatic degree, American business is taking the long view in making its plans for capital investment. It is developing a program which, if successfully carried out, will go far toward eliminating the habitual, destructive surging and sagging of what is in effect the central power house of our economic system—capital investment by business. Upon the level of this investment depends not only the general state of our prosperity but our progress in raising the American standard of living with new products and new and better industrial processes.

Seven years ago, when we first asked industry to estimate its capital spending beyond the current year, only a small minority of companies could give us any estimates at all. This year, 87% of the cooperating companies—and it was a far larger number of companies—could comply with our request for estimates for the years 1956-1958.

It Pays to Bet on Growth

A number of developments help explain the increase in long-range planning of capital investment. One is the increasing technical complexity of American industry. It often takes longer, in this complicated age, to work out a successful installation of new plants and equipment. Another reason for long-range planning is American business management's increasing conviction that it pays to bet on the demonstrated capacity of the American economy to grow over the long pull. With this goes a corresponding determination not to let short-term business fluctuations upset individual company plans for growth through addition of new plants and equipment. An additional factor, and one of great and increasing importance, is the sense of public responsibility on the part of American business leaders who want to help prevent destructive swings in the levels of new investment.

It cannot be too strongly emphasized that there is still nothing automatic about the carrying out of these long-range plans for business spending. Actual expenditures are still governed in major degree by the general health of our economy. This is fully attested by the fact that the current business recovery has led to a substantial upward revision of the investment plans reported to us last fall when we made a preliminary check of plans for 1955. Either private economic excesses or a reversal of the recent improvements in federal tax policy could gravely upset realization of present plans. Fortunately, neither of these possibilities seems to be an immediate threat.

The very fact, however, that American business management has made these plans and will do its utmost to carry them out is a development of tremendous constructive importance for the American economy. It means that major efforts are being made to tame what historically has been an economic wild horse—the process of capital investment by business. Both for doing it, and for telling us about it in our annual surveys, we extend to American industry our sincere thanks.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

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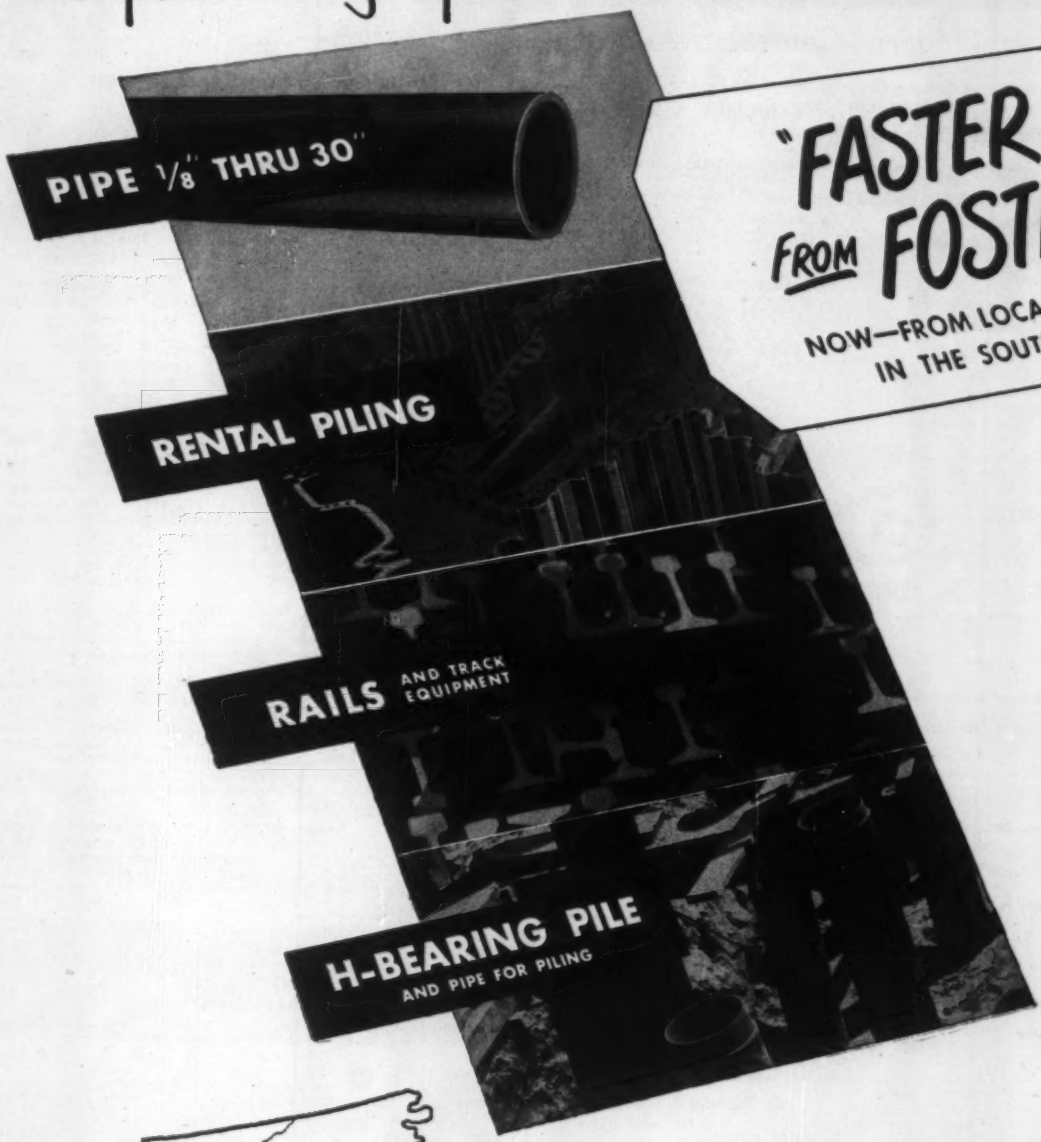
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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

Mass., Sharon—SITE WORK—BA 6/9—Town, High School Bldg. Comn., Awarding Auth., site work and utilities for new high school, off Pond St. $100,000. Anderson & Nichols Co., 15 Causeway St., Boston, archt. CD 3/21, under Public Buildings.

MASSACHUSETTS—BA 6/14—Massachusetts Turnpike Auth., 80 Boylston St., Boston, Zone 16,

West Springfield and Chicopee—Contr. 51-061, concrete deck of Connecticut River Bridge. Plans deposit $25. Howard, Needles, Tammen & Bergendoff, 80 Boylston St., Boston, Zone 16, general consultant engrs.; adv. ENR 6/2. CD 8/11, under Streets and Roads.

MASSACHUSETTS—BA 6/16—Massachusetts Turnpike Auth., 80 Boylston St., Boston, Zone 16,

Chicopee and Ludlow—Contr. 51-193, hy. and bridge constr. Plans deposit $100, not refundable. Charles A. Maguire & Assoc., 14 Court Square, Boston, section engrs. Howard, Needles, Tammen & Bergendoff, 80 Boylston St., Boston, Zone 16, general consultant engrs., adv. ENR 6/2. CD 8/11.

† N. H., Portsmouth—CLUB—BA On Or About 6/21—U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass., officers' club, N.C.O. club, high altitude training bldg., special weapons bldg., and security gate house, Portsmouth Air Force Base, ENG-19-016-55-153. Plans deposit $25. CD 9/13/51.

BIDS ASKED—BUILDINGS

Conn., New Haven — SCHOOL — BA 6/6 — City, Supt. Schools, 169 Church St., Bassett Junior High School. $600,000. Plans deposit $50. Lester J. A. Julianelle, 241 W. Orange St., and Carl R. Blanchard, Jr., 11 Whitney Ave., archts. CD 11/29.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Del Prete Constr. Co., Inc., 177 Concord St., Rockland, Mass. CA $66,715, est. $66,000. riprap shore protection and sea wall repairs Gun Rock and Green Hill, Hull, MASSACHUSETTS. Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. Bids May 10. CD 5/2.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Warner Bros., Inc., Main St., Sunderland, Mass. LB $424,336, est. $420,000. hy. and bridge constr. Rte. 112, Ashfield Rd., S 83 (4), Buckland. Bids May 17. CD 5/4.

▲ MASSACHUSETTS — Massachusetts Turnpike Auth., 80 Boylston St., Boston,

L. G. DeFelice & Sons, Inc., Nettleton Ave., North Haven, Conn. LB $3,322,181. hy. and bridge, Contr. 51-192, Chicopee. Bids May 19. CD 4/27.

National Gunite Corp., 101 W. Dedham St., Boston, Mass. CA Approx. $50,000. 500,000 gal. tank gunite type concrete constr., ASHLAND, MASS. Town, Special Standpipe Comn. Office, Water Comn., Cherry St., Ashland, Mass.

† U. S. Eng., 847 Commonwealth Ave., Boston, Mass. cancelled bids to have been opened about May 24, taxiway lighting, Hanscom Air Field, ENG-19-016-55-145, BEDFORD, MASS. CD 5/12.

▲† Merritt-Chapman & Scott Corp., 260 Madison Ave., New York, N. Y. CA $7,995,425. pier and building rehabilitation at South Boston Army Base, BOSTON, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 5/18, under LB.

† Gil Wyner Co., Inc., 12 Newland St., Malden, Mass. and Grande & Sons, Inc., 425A Broadway, Everett, Mass. LB $969,456, est. $950,000. apron strengthening calibration hardstands Westover Air Force Base, ENG-19-016-55-19, CHICOPEE FALLS, MASS. U.S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids May 17. CD 5/2.

† Gilbane Bldg. Co., 90 Calverley St., Providence, R. I., LB $628,646, Special AAA Facilities, ENG-19-016-55-106, North Kingston, RHODE ISLAND. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids June 16. CD 5/11.

BUILDINGS

LOW BIDS AND CONTRACTS

Brunswick Industrial Development Corp., 23 Spring St., Brunswick, Me., rejected bids May 16, FACTORY, BRUNSWICK, ME. Est. approx. $95,000. Will readvertise, CD 5/3.

E. & A. Bilodeau Bros., Inc., 691½ Lisbon St., Lewiston, Me. LB $99,800, est. $125,000. WAREHOUSE, Knox St., LEWISTON, ME. Roby Brothers Inc., 101 Knox St., Lewiston, Me. Stanley S. Merrill, 9 Vine St., Auburn, Me., archt.

J. J. Powers Co., 127 Alewife Brook Parkway, Cambridge, Mass. CA Approx. $100,000. WAREHOUSE addn., CAMBRIDGE, MASS. Ward Steel Co., 87 Rindge Ave. exten., Cambridge, Mass. Waghorne Brown Co., 48 Franklin St., Boston, Mass., engr.

▲ M. Spinelli & Sons, Inc., 25 Moulton St., Cambridge, Mass. LB $3,586,000. Housing Proj. PHA Mass. 1-3, LOWELL, MASS. Lowell Housing Auth., 18 Market St., Lowell, Mass. Bids May 18. CD 4/20.

DelSignore Constr. Corp., 340 Main St., Worcester, Mass. LB $418,588, est. $350,000. Boys' Trade High SCHOOL addn., Concord and Prescott Sts., WORCESTER, MASS. City, Trustees of Independent Industrial Schools of Worcester, Grove St., Worcester, Mass. Bids May 18. CD 5/10.

▲ Nolan R. Kerchner, Main St., Avon, Conn., Owner Builds, $1,000,000, 85 RESIDENCES, Avon Rd., Northington, AVON, CONN.

Dwight Building Co., 152 Temple St., New Haven, Conn. CA Approx. $400,000, 63,000 sq. ft. FACTORY addn., MILFORD, CONN. U. S. Electrical Motors, Inc., Old Gate Lane, Milford, Conn. Bids Apr. 29. CD 4/27.

George E. Emerson, Inc., 34 Briton St., Pittsfield, Mass., LB, $547,984. Elementary SCHOOL, NORTH CANAAN, CONN. Town Bldg. Comn., Community House, North Canaan, Conn. Bids May 17. CD 5/4.

▲ Edward Waltman & Assocs., South Center St., Windsor Locks, Conn. Owner Builds. $1,000,000. RESIDENTIAL DEVELOPMENT, WINDSOR LOCKS, CONN.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† Md., Cheltenham—BA 6/8—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., hot asph. concrete paving at Naval Radio Station, NOY 88743. Plans deposit $10.

N. Y., Middletown—LIGHTING SYSTEM—BA 6/9—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, grounds, lighting sys., Middletown State Homeapathic Hospital. Plans deposit $15. CD 7/9/53, under Public Buildings.

New York—D.C. CONNECTIONS etc.—BA 6/10—New York City Transit Auth., 370 Jay St., Brooklyn, furnishing, installing D.C. connections and track bonding for Rockaway Line, Liberty Ave. to Mott Ave. at Rockaway Park, Queens Boro, CD 8/3145.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

PENNSYLVANIA—BA 6/10—State Hy. Dpt., 506 North Office Bldg., Harrisburg,

Butler and Armstrong Counties—34,608 ft. crushed aggreg. base with bit. surf. T.R. 422, Summit, Clearfield and W. Franklin Twps., Plans deposit $17.50.

Lycoming Co.—wid'n. 4,729 ft. road with crushed aggreg. base and bit. LR 41045 (6) Loyalsock Twp., Plans deposit $5.

Westmoreland Co.—23,586 ft. c conc. pavement with I-beam bridge T.R. US 30 Libonier Twp. and Ligonier Boro, Plans deposit $20. C. J. Richards, co owner, ch. engr.

N. Y., Brooklyn—BA 6/14—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Contract I-26-2, Williams Ave. tide gate chamber and regulator, reconstr., imprv., 26th Ward Pollution Control Proj. Plans deposit $10.

†Md., Indian Head—EQUIPMENT, etc.—BA 6/16—Dist. P. Wks Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., installing equip., incl. process, river water, well water, oil hydraulic, steam, condensate, brine, air, control, electrical deluge and sprinkler system in Bldgs. 849, 854, and 856 Patterson Pilot Plant, Naval Powder Factory, NOY 88722. Plans deposit $40.

N. Y., Brooklyn—BA 6/16—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, screening chamber and misc. imprvs. at Coney Island Pollution Control Proj. Plans deposit $25.

N. Y., Marcy—VENTILATION—BA 6/16—Bureau Contracts & Accounts, New Alfred E. Smith State Office Bldg., Albany, ventilation of roof spaces, waterproofing, and appurtenant work, Bldgs. Nos. 1, 2 and 3, replacement of steel sash and screening windows, Bldg. No. 2 and portions of Bldg. No. 1, Marcy State Hospital. Plans deposit $30. CD 7/12/45, under Public Buildings.

New York—RAILROAD STRUCTURE—BA 6/17—New York City Transit Auth., 370 Jay St., Brooklyn, Route No. 119-G (Rockaway Route) reconstr. railroad structure between Liberty and 133 Aves to eliminate Track No. 4, grade crossings, Queens. CD 8/31/45.

BIDS ASKED—BUILDINGS

N. Y., Beacon—HOSPITAL—BA 6/9—Bureau Contracts & Accounts, New Governor Alfred E. Smith State Office Bldg., Albany, alterations to rooms Matteawan State Hospital. Plans deposit $10. CD 3/14/45.

N. Y., New York—BUILDING ALTERATIONS—BA 6/21—Ch. Engr., the Port of New York Auth., 111 8th Ave., Zone 11, alterations, incl. air-conditioning to southeasterly portion of seventh floor of Port Authority Bldg. at Eighth Ave. and 15 St., Contr. EXD-130-016. Plans deposit $30. CD 1/18/54.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Novak & Co., Inc., 19 Waverly Place, New York 3, N. Y. LB $177,783. sewage treatment plant at gas stations and restaurants at Sloatsburg, Rockland Co., for New York State Thruway Authority, NEW YORK. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Bids May 19. CD 4/25.

▲ NEW YORK—State Dpt. P. Wks., John W. Johnson, supt. P. Wks., Chancellor's Hall, State Education Bldg., Albany,

N. Y.—S J. Groves & Sons Co., Empire Bldg., Syracuse, N. Y LB $2,628,041, est. $3,044,000. constr. State Thruway's tri-level triple interchange bridge, connecting ramps on 77 acre site in Town of Cheektowaga just east of Buffalo where Ontario, Erie and Niagara sections of Thruway converge, Erie Co. Nine bids received. Bids May 19. CD 4/28.

▲ NEW YORK—State Dpt. P. Wks., John W. Johnson, supt. P. Wks., Chancellor's Hall, State Education Bldg., Albany,

N. Y.—Bero Constr. Co., McKinley Bldg., Buffalo, N. Y. LB $909,813, est. $1,271,000. wid'n., realigning, resurf. 11.07 mi. section of Rte. 31 between Elmgrove Rd. east of Spencerport and Rte. 19 intersection just south of Brockport, Monroe Co. Eight bids received;

N. Y.—The Callanan Road Imprvt. Co., South Bethlehem, N. Y LB $284,795, est. $379,000. resurf. 4.95 mi. 2 sections of Rte. 9 (Albany Post Rd.) from Dutchess-Columbia Co. line southward to point about ½ mi. north of Red Hook's Village line from Red Hook's south village line southward to Rhinebeck-Red Hook town line, Dutchess Co. Seven bids received;

N. Y.—City Constr., 640 Jay St., Utica, N. Y. LB $366,868, est. $441,000. wid'n., resurf. 3.98 mi. work on Rte. 11 starting at Canton's east village line exten. northeastward toward Potsdam, St. Lawrence Co. Six bids received;

N. Y.—Torrington Constr., Co., Inc., Torrington, Conn. LB $353,010, est. $414,000. wid'n., resurf. Rte. 11 at intersection of Rtes. 9 and 11 in Champlain and exten. eastward 3.26 mi. to point about ½ mi. west of Rouses Point, Clinton Co. Five bids received;

N. Y.—E. G. DeLia & Sons Constr. Corp., New Hartford, N. Y. LB $548,671, est. $723,000. wid'n. resurf. Rte. 12 at north city line of Norwich and exten. 7.82

(Continued on page 121)

Crossing the Schuylkill with Atlas

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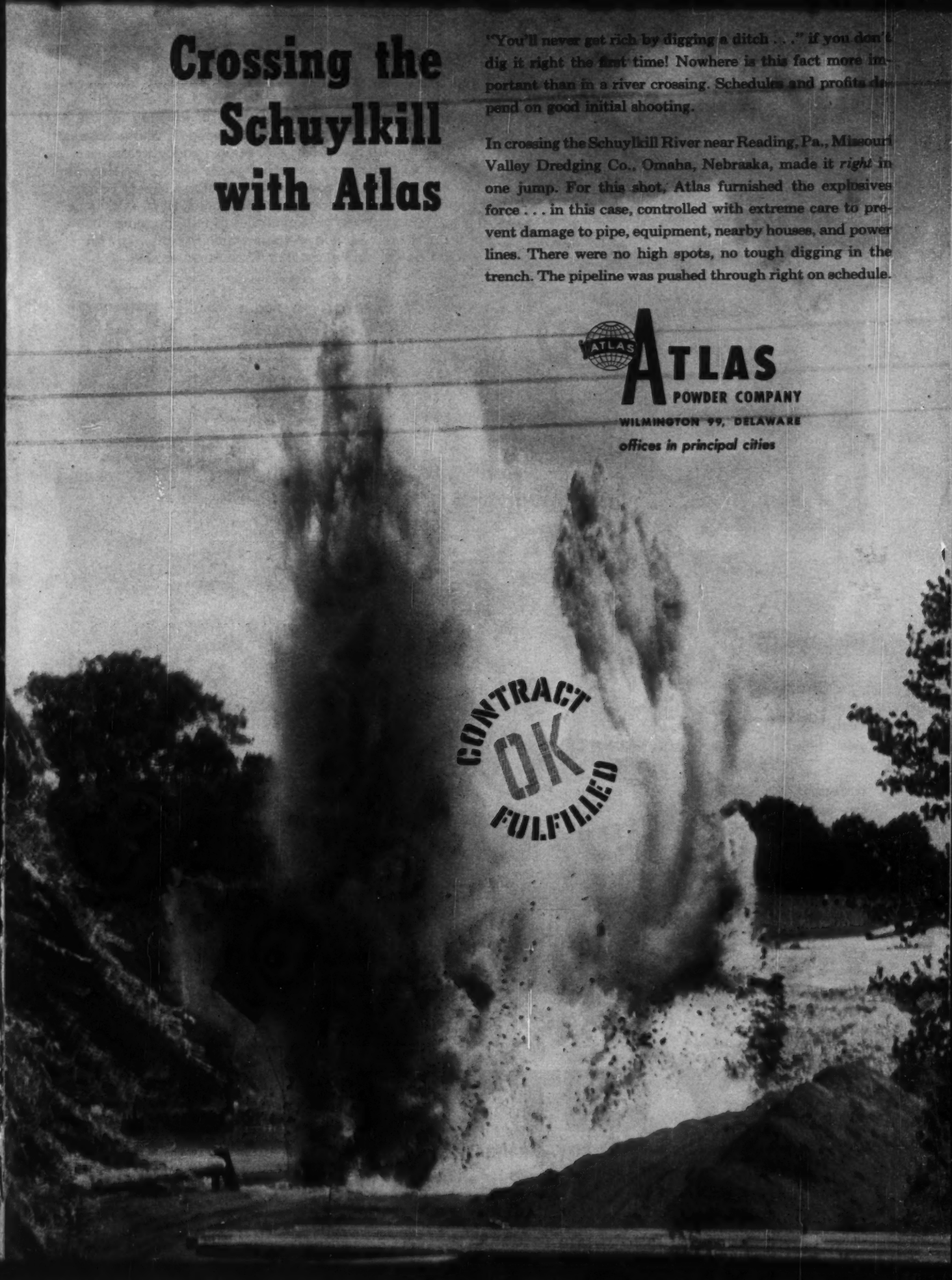

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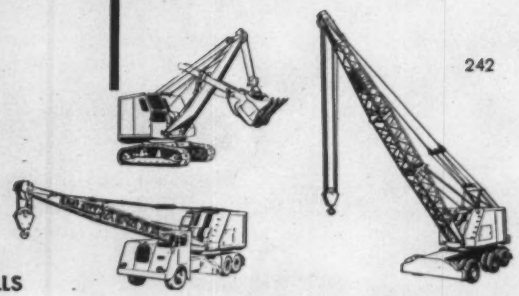

242

BAY CITY

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(Continued from page 118)

mi. northward through north Norwich to West Brook about 3 mi. south of Sherburne, Chenango Co. Thirteen bids received;

N. Y.—**Depew Paving Co., Inc.**, Depew, N. Y LB **$306,519**, est. $361,000. wid'n., resurf. work on Transit Rd. (Rtes. 20 and 78) starting in Depew at south end of Cayuga Creek Bridge just south of intersection of Transit Rd. and Broadway exten. southward for 1.08 mi. Erie Co. Seven bids received;

N. Y.—**John M. Robertson, Inc.**, Oneonta, N. Y. LB **$410,655**, est. $495,000. wid'n., resurf. work on Rte. 26 about 100 ft. north of Lowville Village line and exten. northwestward for 3.98 mi., Lewis Co. Seven bids received;

N. Y.—**Cable Guide Railing Constr. Co., Inc.**, Depew, N. Y. LB **$182,550.** installing 80,500 lin. ft. guide railing between Ulster and Montgomery County lines, Albany, Greene and Schenectady Counties. Seven bids received;

N. Y.—**L. J. Thorton, Inc.**, Lancaster, N. Y. LB **$282,162.** installing 122,050 lin. ft. railing between Kingston and Suffern, Orange, Rockland and Ulster Counties. Eight bids received. Bids May 19. CD 4/28.

▲ **Westinghouse Air Brake Co.**, 350 Fifth Ave., New York 1, N. Y. CA **$6,499,325**, furnishing, installing block signalling and interlocking equipment for Rockaway Line south of North Channel Drawbridge to Far Rockaway and to Rockaway Park, IND, DIV, Queens Boro, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Apr. 14, awarded May 19. CD 4/19, under LB.

Klevens Corp., 3 Federal St., Yonkers, N. Y LB **$117,680.** pedestrian overpass across Henry Hudson Parkway between W. 235 and W. 236 Sts., NEW YORK, N. Y. President Bronx Boro, Bronx County Bldg., 851 Grand Concourse, New York 51, N. Y. Bids May 17. CD 5/9.

▲† **Industrial Engineering Co.**, 50 Church St., New York 7, N. Y. LB **$1,565,071.** hangar and crash house, Naval Air Station, NOY 70362, Spec. 31949, NIAGARA FALLS, N. Y. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y. Bids May 19. CD 5/13.

† **Matthew L. Carroll, Inc.**, 101 Park Ave., New York 17, N. Y. CA **$657,198.** ground electrical storage shops, AMC FY 53, Griffiss Air Force Base, ROME, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. CD 5/10, unler LB.

Joseph A. Lee Constr. Co., 3103 Farragut Rd., Brooklyn 10, N. Y. LB **$317,750.** Contr. 1-J-22 (1) structural and mechanical work for installation of external sludge heaters and misc. work, Jamaica Pollution Control Proj., SOUTH OZONE PARK, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids May 18. CD 4/21.

▲ **NEW JERSEY**—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,

Charles F. Vachris, Inc., 9024 Ditmas Ave., Brooklyn, 36, N. Y., CA, **$1,572,493**, Contracts N-10B, Concrete decks for Newark Viaduct on east side of Newark Airport Interchange of Turnpike for viaduct at Newark Airport Interchange, portion of Newark-Bay-Hudson County Exten., Newark, Essex Co. Bids Mar. 24. CD 3/28, under LB.

NEW JERSEY—New Jersey Hy. Auth., 12 Broad St., Red Bank

rejected bids Mar. 24, Contract MM7, Districts 1, 2, 4, 5, 6 and 7, mowing, weed control, placing topsoil, fertilizing and seeding grass areas on parkway, LB **$774,733.** CD 3/29, under LB.

Frank Bryan, Inc., Mckees Rock, Pa., LB, **$143,093** flood control work on Tody Creek, Brockway Jefferson Co., PENNSYLVANIA State Dpt. Forest & Waters, Education Bldg., Harrisburg, Pa. Bids May 16. CD 5/4.

MARYLAND—State Rds. Comm., 108 E. Lexington St., Baltimore, Zone 2,

A. H. Smith, Branchville, Md. LB **$210,256**, stone. **$209,990**, slag surfacing 2.715 mi. dual hy. near Waldorf, Contr. CH 257-12-520, Charles Co. Bids May 17. CD 5/12.

Mulian Contg. Co., 3945 Greenmount Ave., Baltimore 18, Md. LB **$320,000**, rein.-con., steel Kirk Ave. athletic field and grandstands, BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. Bids May 18. CD 5/12.

▲† **James Mc Hugh Constr. Co.**, 6449 S. South Park Ave., Chicago, Ill., LB, **$4,473,053.** Little Falls Dam, intake pumping station in Montgomery Co., Maryland, CIVENG-49-080-55-10, WASH., D. C. U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C. Bids May 19. CD 5/5, under Maryland.

BUILDINGS

LOW BIDS AND CONTRACTS

135 Willow Corp., 885 Flatbush Ave., Brooklyn 26, N. Y. Owner Builds. **$900,000.** 10 story APARTMENT, 127-141 Willow St., BROOLYN, N. Y. Ralph E. Leff, 12 E. 48 St., New York 17, N. Y. archt.

▲ **S. S. Silberblat, Inc.**, 25 W. 45 St., New York, N. Y. LB **$3,037,500**, general constr. six 7 story apartments for Kensington Heights (Proj. NYS 61-C), steel and masonry constr., Fillmore and Kensington Aves., BUFFALO, N. Y. Buffalo Municipal Housing Auth., City Hall, Buffalo 2, N. Y. Bids May 18. CD 5/12.

John H. Knox Co., 1736 Fillmore Ave., Buffalo, N. Y. **$396,911**, plumbing work (BMHA).

▲ **Parkway Village Homes**, c/o Long Island Homes, 168-12 Hillside Ave., Jamaica, 32, N. Y. Owner Builds. **$1,000,000.** 62 HOUSES on tract on Merritt Rd., FARMINGDALE, N. Y.

▲ **Knickerbocker Knolls Homes**, c/o Oscar I. Silverstone, archt., 666 Fifth Ave., New York 19, N. Y. Owner Builds, **$1,600,000**, 100 HOUSES on tract at Walt Whitman Rd., HUNTINGTON, N. Y.

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Laurelton Park Homes, c/o Butterly & Green, Inc., 168-25 Hillside Ave., Jamaica, N. Y. Owner Builds. **$950,000.** 55 HOUSES on tract at 22 St. and 139 Ave., LAURELTON, N. Y.

Manchester Homes, c/o Farmingdale Realty Corp., 174 Fulton St., Farmingdale, N. Y. Owner Builds. **$675,000.** 48 HOUSES on tract at Hicksville Rd. and Manchester Dr., MASSAPEQUA, N. Y.

▲ **Eileen Gardens Homes**, c/o Walter Daub, 26 Nassau Blvd., Garden City, N. Y. Owner Builds **$1,300,000.** 100 HOUSES on tract near county line Rd. south of Southern State Parkway, MASSAPEQUA, N. Y.

▲ **Ocean Lea Homes**, c/o Lane Realty, 107-40 Queens Blvd., Forest Hills, N. Y. Owner Builds. **$1,500,000** 100 houses on tract at Fulton Ave. and Vermont Ave., OCEANSIDE, N. Y.

S & G Padula Builders, Inc., 181 N. Washington Ave., Bergenfield, N. J., CA, **$344,000.** 14 HOUSES on tract on E. Church St. near Washington Ave., BERGENFIELD, N. J. Lynne Brook Manor Homes, c/o contractor.

▲ **Rolling Hills Homes**, c/o Leonard G. Feinen, archt., 320 Lincoln Ave., Hasbrouck Heights, N. J., Owner Builds. **$1,500,000,** 107 HOUSES, on 40-acre tract on Chittenden Rd. near Broad St., CLIFTON, N. J.

▲ **Oradell Forest Homes**, c/o C. J. Kordys, archt., 116 Passaic St., Passaic, N. J. Owner Builds, **$1,350,000.** 54 HOUSES on tract on Wildwood Road east of Kinderkamack Rd, ORADELL, N. J.

Baton Constr. Co., 1717 Sansom St., Phila., Pa., CA, **$800,000,** Central TELEPHONE OFFICE, WILMINGTON, DEL. Diamond State Telephone Co., 1401 Arch St., Phila., Pa. CD 3/18, under LB.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **N. C., Jacksonville**—GRASSING AND EROSION CONTROL—BA 6/7—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va., grassing and erosion control Marine Corps Air Facility, New River, NOY 88382, Spec. 45351. Plans deposit $10.

† **Va., Dam Neck**—BA 6/7—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base., Norfolk relocation of sanitary sewer line, Fleet Air Defense Training Center, NOY 88390, Spec. 45354. Plans deposit $10. CD 3/4/54.

† **Va., Yorktown**—BOOTH INSTALLATION—BA 6/7—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, installing paint spray booth Naval Mine Depot, NOY 86559, Spec. 45303 S/F and Add 1 and 2, Plans deposit $10.

† **Va., Quantico**—RESURFACING, etc.—BA 6/8—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., resurfing road and seal coating drill fields, Marine Corps. Schools NOY 85554. Plans deposit $10.

Ky., Frankfort—AIRPORT IMPRVS.—BA 6/9—State Div. Purchases, Frankfort, airport imprvs., S-3355, Part I grading, draining, paving, 1,200 ft. existing runway, Part 2 medium intensity lighting system. Plans deposit $25, refundable, Simpson & Heil, Bowman Field, engrs.

† **N. C., Cherry Point**—BARRACKS—BA 6/9—Dist. P. Wks. Office Fifth Naval Dist., U. S. Naval Base, Norfolk, Va., rehabilitation of barracks Marine Corps Air Station, NOY 88353, Spec. 45332. Plans deposit $20.

† **Va., Norfolk**—BUILDINGS, etc.—BA 6/9—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, repairs and alterations to buildings, Naval Air Station, NOY 88425, Spec. 47297. Plans deposit $10 CD 1/25/54.

† **Va., Oceana**—FIRE STATION—BA 6/9—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, fire station, U. S. Naval Air Station, NOY 85875, Spec. 43061. Plans deposit $10. CD 11/24/53.

† **Florida**—BA About 6/10—U. S. Eng., P.O. Box 4970, Jacksonville, riprap repairs along lakeward toe of Lake Okeechobee Levee in Divisions 2 and 9 Central and Southern Florida Flood Control Proj. CIVENG-08-123-55-58. CD 11/24/43.

† **N. C., Camp Lejeune**—COMBAT TRAINING FACILITIES—BA 6/10—P. Wks. Officer, Marine Corps Base, combat training facilities, range houses and small arms magazine, Spec. 43090. Plans deposit $10.

† **Ga., Savannah**—STORAGE MAGAZINES—BA About 6/14—U. S. Eng., 200 East St. Julian St., ang ammunition storage magazines, Travis Field, Serial No. ENG-09-133-55-74.

Ala., Birmingham—BA 6/14—Jefferson Co., Court House, grading 9 mi. Wylan-Birmingport Rd. C. J. Rogers, co. engr.

† **La., Shreveport**—DORMITORIES—BA 6/14—U. S. Eng., P. O. Box 867, Little Rock, Ark., 3 story, 41x205 ft. masonry airmen's dormitories Barksdale Air Force Base, ENG-03-050-55-124, $100,000-$500,000. CD 5/23.

† **La., Shreveport**—DORMITORIES—BA About 6/15—U. S. Eng., P.O. Box 867, Little Rock, Ark. Job. No. Barksdale AFB-55-ACRP AF Airmen's Dormitories No. 2A, Item No. T-012 (G311-321) Barksdale Air Force Base, ENG-03-050-55-124.

† **Fla., Orlando**—DISTRIBUTION SYSTEM—BA On Or About 6/21—U. S. Eng., P. O. Box 4970 Jacksonville, electrical distr. sys. alterations, utilities for wing hangars (FY-54) Pinecastle Air Force Base, Pinecastle, ENG-08-123-55-100. CD 1/31/51.

† **S. C., Beaufort**—HANGARS, etc.—BA 6/21—Dist. P. Wks. Office, Building No. 12, U. S. Naval Base, Charleston, S. C., 4 squadron hangars, 1 Class "C" maintenance hangar, various ordnance, storage structures, NOY 85631, Spec. 45186, Plans deposit $80; aircraft parking apron NOY 85630, Spec. 45185, U. S. Marine Corp., Auxiliary Landing Field. Plans deposit $40. CD 3/25.

† **N. C., Fort Bragg**—HANGAR, etc.—BA About 6/22—U. S. Eng., 308 Customhouse, Wilmington, hangar and water pumping station, with water reservoir, Smith Lake Area, ENG-31-075-55-65. CD 12/26/51.

† **La., New Orleans**—RESERVOIR, etc.—BA 6/22—Officer in Charge of Constr., Eighth Naval Dist., Bldg. 16, U. S. Naval Station, reservoir and pumping station, Joint Air Reserve Training Center, Alvin Callender Field, NOY 84260, Spec. 43888. CD 11/17/53.

† **Ga., Fort Benning**—BA About 6/24—U. S. Eng., 200 East St. Julian St., Savannah, relocating, Dixie Road (FY-52) Fort Benning, Serial No. ENG-09-133-55-69.

BIDS ASKED—BUILDINGS

† **N. C., Fort Bragg**—POST EXCHANGE—BA About 6/21—U. S. Eng., 308 Customhouse, Wilmington, branch post exchange, ENG-31-075-55-62. CD 12/26/51.

▲† **Ky., Fort Campbell**—HOUSING—BA 6/21—U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn., 300 housing units, 1 and 2 story, frame, brick veneer, utilities, ENG-40-058-55-23, $3,000,000. Plans deposit $25, refundable, Brush, Hutchison & Gwinn, 1609 Church St., Nashville, Tenn., archts. CD 5/18.

Ga., Washington—SCHOOLS—BA 6/28—State School Bldg. Auth., 41 Exchange Pl. S.E., Atlanta, Wilkes County Training School, McDonald & Co., 41 Exchange Pl. S.E, Atlanta, archts.; Washington High School, Stevens & Wilkinson, 177 Luckie St. N.W., Atlanta, archts., Tignall Elementary School, Kuhlke & Wade, 16 Campbell Bldg. Augusta, archts. Plans deposit $50 each. CD 7/6.

SOON LETS CONTRACT—BUILDINGS

▲ **Ky., Louisville**—PLANT—Reynolds Metal Co., 2500 S. Third St., soon lets contract superstructure for aluminum anodizing plant addn. CD 4/25/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **VIRGINIA**—Commonwealth of Va., Dpt. of Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond,

Diamond Constr. Co., P.O. Box 1074, Savannah, Ga., LB, **$1,106,266.** Contract No. 2 and Contract No. 3, 2,297 ft. bridge over Pamunkey River at West Point, Proj. 1963-03, S-436 (4) King William and New Kent Counties. Bids May 18. CD 5/4.

VIRGINIA—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond,

Va.—**Pioneer Constr. Co., Inc.**, P.O. Box 137, Roanoke, Va., LB **$81,880.** soil aggreg. bit. surf. tr. 4.73 mi. Rte. 613, State Proj. 1381-15, Fed. Proj. S-554 (2), Rockbridge Co.;

Va.—**James A. McQuail Contg. Co.**, 1204½ Virginia Ave., Bluefield, Va., LB, **$75,355.** soil aggreg., bit. surf. tr. 3.28 mi. Rte. 670, State Proj. 132508, Fed. Proj. S-201 (2), Dickenson Co.;

Va.—**W. H. Scott, Inc.**, P.O. Box 418, Franklin, Va., LB **$79,944.** soil aggreg. base, bit. surf. tr. and bridge 0.67 mi. Rte. 153, State Proj. 5404-0203, Fed Proj. S-864 (1), Amelia Co. Bids May 18. CD 5/4.

Sidney Johnston, 3901 Wilson Blvd., Arlington, Va., LB, **$137,105,** storm sewer in N. Ohio St. from N. Washington Blvd. to 13 St. North, ARLINGTON, VA. Arlington Co. Hy. Div., Court House, Arlington, Va. Bids May 17. CD 5/10.

† **Allied Constr. Co., Inc.**, 940 Old Little Creek Rd., Norfolk, Va., LB **$99,895,** pavement repairs Naval Air Station, NOY 86587, Spec. 45323, NORFOLK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 17. CD 4/29.

T. A. Loving & Co., Bank of Wayne Bldg., Goldsboro, N. C. LB **$168,280.** bachelor officers quarters, addns. to officers mess, Marine Corps Air Facility, New River, NOY 85880, Spec. 43066, JACKSONVILLE, N. C. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 17. CD 5/2.

† **T. A. Loving Co.**, 120 N. Salisbury St., Raleigh, N. C. LB **$140,586.** imprvts. at airport excav., drainage, pavement, etc., RALEIGH-DURHAM, N. C. Raleigh Durham Airport Auth., J. R. Patton Jr., Durham, N. C. Wm. C. Olsen & Assoc., 5 Exchange Pl., Raleigh, N. C., engr. Bids May 16.

▲ **SOUTH CAROLINA**—State Hy. Dpt., Hotel Columbia, Columbia,

S. C.—**J. F. Cleckley & Co.**, Orangeburg, S. C., LB, **$111,799,** bit. surf. 13.262 mi. Roads S-75, S-8, S-206, S-57 and S-19k, S-31, 37, S-12 and S-49, S. C. Dockets Nos. 5.294, 5.295 and 15.306, F.A. Proj. S-785 (2), S-712 (2) and S-304 (2), Bamberg and Colleton Counties; LB **$125,904,** bit. surf. 12.653 mi. Roads S-399, S-58, S-59, S-73, S-135, S-142 and S-510, S. C. Dockets Nos. 13.336 and 13.339, Chesterfield Co.; LB **$137,348.** bit. surf. 14.039 mi. Roads 20, 29, 90, 107, 114, 115, and 116, S. C. Docket No. 27.273, Jasper Co.;

S. C.—**Banks Constr. Co., Inc.**, Charleston Heights, S. C., LB **$282,868.** b. conc., surf., constr. concrete curb, gutter and sidewalk 2.682 mi. U.S. Rte. 17, Rte. 61 and 700, S. C. Dockets Nos. 10.399.2 and 10.426, F.A. Proj. Nos. F-2589 (1), Parts 1 and 2 and U-145, (3), Charleston Co.;

S. C.—**Suber & Co., Inc.**, Whitmire, S. C. LB, **$227,163.** b. conc. surf. and wid'n. to four-lanes 1.958 mi. U.S. Rte. 25, S. C. Docket No. 23.373, F.A. Proj. F-261 (3), Greenville Co.;

S. C.—**Bituminous Constr. Co., Inc.**, Whitmire, S. C., LB **$156,554,** bit. surf. 15.534 mi. Roads 34 and 60, 98 and 34, S. C. Dockets Nos. 26.331 and 26.332, F.A. Proj. No. S-895 (1), Horry Co.;

S. C.—**Reeves Brothers Constr. Co., Inc., Easley, S. C.**, LB **$110,575.** bit. surf. 9.001 mi. Roads 57 and 127, 128 and 173, S. C. Docket No. 37.358, Oconee Co.;

S. C.—**Crowder Constr. Co., Inc.**, 1123 E. 10 St., Charlotte, N. C., LB **$186,440.** b. conc. surf. constr. concrete curb, gutter, sidewalks 1.222 mi. U.S. Rte. 521, Rte. 903 and Road 78, S. C. Docket No. 29.319, F.A. Proj. F-10 (4), Parts 1 and 2, Lancaster Co.;

S. C.—**Claussen-Lawrence Constr. Co.**, 1394 Gwinnett St., Augusta, Ga., LB, **$168,719.** grading, surf. 12.693 mi. Roads 601 thru 636, S. C. Docket No. 10430, Charleston Co.;

S. C.—**Ed. L. Smith**, Columbia, S. C., LB, **$91,389.** bit. surf. 8.752 mi. Roads 343, 201, 390 thru 400, 407 thru 411, 385 thru 389 and 415 thru 419, S. C. Docket No. 2.379, Aiken Co. Bids May 17. CD 5/6.

Koller Constr. Co., 814 High St., Houma, La. LB **$440,033.** sanitary sewer facilities East Louisiana State Hospital, JACKSON, LA. State Bldg. Auth., State Capitol, Baton Rouge, La. Barnard & Burk, 1023 Nicholson Dr., Baton Rouge, La., engrs.

Austin Bridge Co., 1000 Singleton Blvd., Dallas, Tex. LB **$519,350,** est. $500,000. Common Street viaduct, SHREVEPORT, LA. City, City Hall, Shreveport, La. Bids May 12. CD 4/26.

Catlett Constr. Co., Inc., 3601 Chapman Hy. S. W., Knoxville, Tenn. CA **$468,886** sanitary trunk sewer and appurtenant structures along Second Creek from Western Ave. north to intersection of Lonsdale and Lincoln Park lines north of Emerald Ave. and necessary connecting lines and appurtenant structures thereto, KNOXVILLE, TENN. City, City Hall, Knoxville, Tenn. Bids Apr. 14. CD 3/8.

† **Ralph Rogers & Co., Inc.**, 720 Argyle Ave., Nashville, Tenn., CA, **$93,142.** street imprvs. for city roads and lanes, Inv. 55-MS-49A, OAK RIDGE, TENN. Management Services, Inc., P.O. Box B, Oak Ridge, Tenn. Bids Apr. 14. CD 4/1.

BUILDINGS

LOW BIDS AND CONTRACTS

Armstrong Constr. Co., Kingsport, Tenn., LB **$764,000.** Bluefield HIGH SCHOOL, Bluefield, PRINCETON, W. VA. Bd. Educ., Princeton, W. Va. Bids May 17. CD 5/3.

▲ **C. M. Guest & Sons**, Jefferson Bldg., Greensboro, N. C. CA **$2,500,000.** INDUSTRIAL PLANT, textile drying and finishing plant, 1⅓ mi. north of ALBEMARLE, N. C. Collins & Aikman, 210 Madison Ave., New York, N. Y.

Forbes & Taylor, P. O. Box 1454, Lexington, Ky. LB Est. **$350,000.** DORMITORY and DORMITORY APARTMENTS, BARBOURVILLE, KY. Union College, Barbourville, Ky. Bids May 17. CD 4/29.

The Allen Co., Winchester, Ky. CA **$270,262.** Contr. 108, Third Unit Bldg. substructural work of STEAM GENERATING STATION, FORD, KY., East Kentucky Rural Electric Co-operative, Ford, Ky. Stanley Eng. Co., Hershey Bldg., Muscatine, Ia., engr. Bids May 9. CD 9/15.

▲ **Harmon Constr. Co.**, 28 S. Indiana St., Oklahoma City, Okla., CA **$1,885,657,** RECEIVING and INTENSIVE TREATMENT CENTER, Central State Hospital for the Insane, NASHVILLE, TENN. State of Tennessee, State Capitol, Nashville, Tenn. Bids May 12. CD 4/20.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Michigan**—AAA FACILITIES—BA 6/7—U. S. Eng., 600 E. Jefferson Ave., Detroit, Zone 26, AAA facilities, Detroit vicinity.

† **O., Mansfield**—CRASH TRUCK STATION, etc.—BA 6/9—U. S. Property & Fiscal Officer, F. Hayes, Bldg. 101, Columbus, crash-truck station, paint, oil and dope bldg. at ANG area, Municipal Airport. CD 3/26/52.

O., Akron—BA 6/13—Comrs. Summit Co., Court House, Akron Bridge No. 14 Kent St. single span steel beam bridge over Little Cuyahoga River, 45 ft. span, 28 ft. roadway, two 3 ft. sidewalks. Plans deposit $10, Leslie Wolfe, co. engr. CD 1/17.

▲ **INDIANA**—BA 6/15—Indiana Toll Road Comn., 309 West Washington St. Old Traisl Bldg., Indianapolis,

Lake Co.—grading drainage, paving 0.8 mi. Secton C-9, East-West Toll Road, Gary. Plans deposit $25; adv. ENR 5/26. CD 2/10/54.

† **Illinois**—BA 6/23—U. S. Eng., 420 Locust St., St. Louis, 2 Mo., pumping statons, East St. Louis and Vicinity Illinois (East Side Levee & Sanitary District) Proj. Item V-B (3), Madison and St. Clair Counties, CIVENG-23-065-55-83. CD 5/28/52.

BIDS ASKED—BUILDINGS

† **O., Chagrin Falls**—ARMORY—BA 6/7—U. S. Property & Fiscal Officer, Ft. Hayes, Bldg. 101, Columbus, 1-unit armory. Plans deposit $25.

O., Miamisburg—SCHOOL—BA 6/7—Bd. Educ., Jas. F. Bartlett, clk., Mark Twain and Intermediate School addns. Plans deposit $20. Thomas D. McLaughlin & John J. Keil, Lima, archts. CD 11/5.

† **O., Toledo**—BUILDING—BA 6/9—Rossford Ordnance Depot, Purch. Div., Toledo, 40x50 ft. metal bldg. with 14 ft. minimum overhead clearance at Rossford Ordnance Depot, S. Oregon Rd., Inv. 144.

O., Canal Winchester—SCHOOL—BA 6/10—Bd. Educ., High School Bldg., grade school, altering existing grade school. Tibbals-Crumley-Musson, 965 E. Broad St., Columbus, Zone 5, archts. CD 11/0.

O., Toledo—SCHOOL—BA 6/10—Bd. Educ., Southard Ave., Old Orchard School, 2402 Cheltenham Rd. $606,300. Plans deposit $15. Bellman, Gillett & Richards, 518 Jefferson St., engrs.-archts. CD 5/11/54.

(Continued on page 126)

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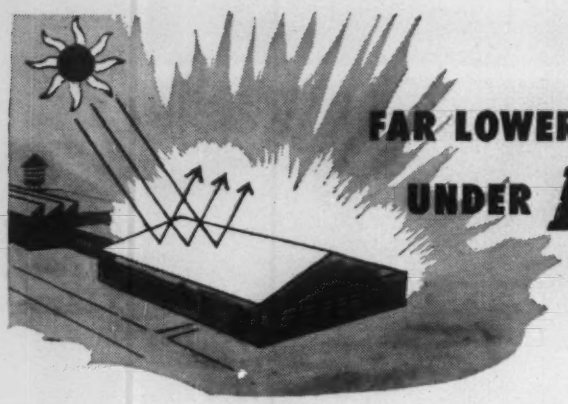

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(Continued from page 122)

O., Bowling Green—RESIDENCE, etc.—BA 6/14—State Dpt. P. Wks., Ohio Dpts. Bldg., Columbus, Zone 4, residence and dining hall for women at Bowling Green State University. Plans deposit $25, Britsch & Munger, National Bank Bldg., Toledo, archts.

† O., Lacarne—SHOP—BA 6/16—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., constr. depot maintenance shop for integrated fire control systems at Erie Ordnance Depot, Ottawa Co., approx. 5.5 mi. west of Port Clinton, and approx. 1.6 mi. north of Lacarne, ENG-46-022-55-16, Peterson, Hoffman & Assoc., 523 Spitzer Bldg., Toledo, Zone 4, engrs.-archts. CD 5/10.

O., Cincinnati—PLANT—Bids Asked—Gibson Art Co., 233 W. Fourth St., greeting card mfg. plant, first section, 150,000 sq. ft. warehouse, offices on Section Rd. $360,000, A. M. Kinney, Inc., 3905 Vernon Pl., engr. CD 4/22, under O., Amberley Village.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Visintine. Jackson & Igoe, Inc., 1314 Delshmut St., Columbus, O. CA $220,000. 180 m.g. reservoir, 46 acre tract west of WASHINGTON COURT HOUSE, O. Ohio Water Service Co., Washington Court House, O.

Loselle Constr. Co., 555 Goddard St., Wyandotte, Mich. CA $167,204. paving cargo area Detroit-Wayne Major Airport, DETROIT, MICH. State, Dpt. Aeronautics, Capitol City Airport, Lansing, Mich. Leroy Smith, 3800 Cadillac Tower, Detroit, Mich., engr. CD 1/16/53.

Birmingham Constr. Co., 208 Savings & Loan Bldg., Birmingham, Mich. CA $107,000. 3 m.g. reservoir, FERNDALE, MICH. City, Wilfred A. Laking, city mgr., 21205 Woodward St., Ferndale, Mich. Ayres, Lewis & Norls & May, 500 Wolverine Bldg., Ann Arbor, Mich., engrs. CD 4/26/54.

Minietti & Ponti, Lincoln Park, Mich. CA $87,174. Snow Drain Storm Sewers, LINCOLN PARK, MICH. City, John M. O'Connor, city clk., Lincoln Park, Mich. Bids May 2. CD 4/21.

† **Prosch Constr. Co.**, Iron River, Mich. CA $925,315. airfield facilities and bldgs., K. I. Sawyer U. S. Air Force Base, MARQUETTE, MICH. U. S. Eng., 600 E. Jefferson Ave., Detroit, Mich. Bids May 10. CD 4/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Mintz Constr. Co.**, 1946 Lee St., Cleveland, O. Owner Builds. $1,750,000. 3 story OFFICE, 3135 Euclid Ave., CLEVELAND, O. B. F. Goodrich Chemical Co., lessee.

C. W. Fry, Greenville, O. CA $443,214. general and electrical contracts GRADE SCHOOL, HIGH SCHOOL addn., COVINGTON, O. Bd. Educ., Covington, O.

▲ **Grant-Holladay Constr. Corp.**, Callahan Bldg., Dayton, O. Owner Builds. $2,000,000. 173 inland steel prefabricated DWELLINGS, on Wolf Rd. in area named Newcom Park, in Harrison Twp. DAYTON, O. CD 11/29.

▲ **Witte Constr. Co.**, 23 Huron St., Toledo, O. Owner Builds. $2,500,000. 138 HOMES on 55 acre site to be known as Griffith Park in northwestern part of city, SYLVANIA, O. Buehrer & Stough, 1029 Sylvania Ave., Toledo, O., archts.

▲ **Stanley Realty Co.**, 701 Union Title Bldg., Indianapolis, Ind., Owner Builds, $3,500,000, laying out new development and building HOMES, INDIANAPOLIS, IND.

O. E. Davis Lumber Ci., 3090 Lafayette Rd., Indianapolis, Ind., Owner Builds, $450,000, low cost HOMES in northwestern section of INDIANAPOLIS, IND.

Built Rite Homes, Inc., Ind. 421 and Kitley Rd., Indianapolis, Ind. Owner Builds, $540,000. HOMES, Glenroy Village, INDIANAPOLIS, IND.

Portwood Constr. Co., 3320 Madison St., Indianapolis, Ind., Owner Builds. $375,000. HOMES in Perry Manor, INDIANAPOLIS, IND.

Mayfield Housing Corp., Kokomo, Ind., Owner Builds, $450,000. HOMES in Dixon Road District, KOKOMO, IND.

Southside Lumber Co., Markland Ave. and Main St., Kokomo, Ind., Owner Builds, $400,000, HOMES at west edge of city of Westmoreland Village, KOKOMO, IND.

R. D. Robbins Co., 109 E. Sycamore St., Kokomo, Ind. Owner Builds, $400,000, HOMES in Kennedy Park, KOKOMO, IND.

Holtz Constr. Co., 824 E. Fisher St., Kokomo, Ind., Owner Builds, $750,000. HOMES in Greenbriar Addn., KOKOMO, IND.

Preferred Realty & Builders, 1045 S. Kedzie St., Chicago, Ill., Own Forces, $675,000. 50 HOMES, 9000 East End Ave., CHICAGO, ILL.

▲ **Robert Enger**, 521 Conkey St., Hammond, Ind., CA, $2,600,000. 200 HOMES, Torrence Ave. to Calumet Expressway and along Sauk Trail, near CHICAGO HEIGHTS, ILL. McEwen Realty Co., 6917 Hohman Ave., Hammond, Ind. Awarded May 2.

L. M. Gervasio, 5361 Madison St., Chicago, Ill., Own Forces, $900,000, 50 HOMES, GLEN ELLYN, ILL.

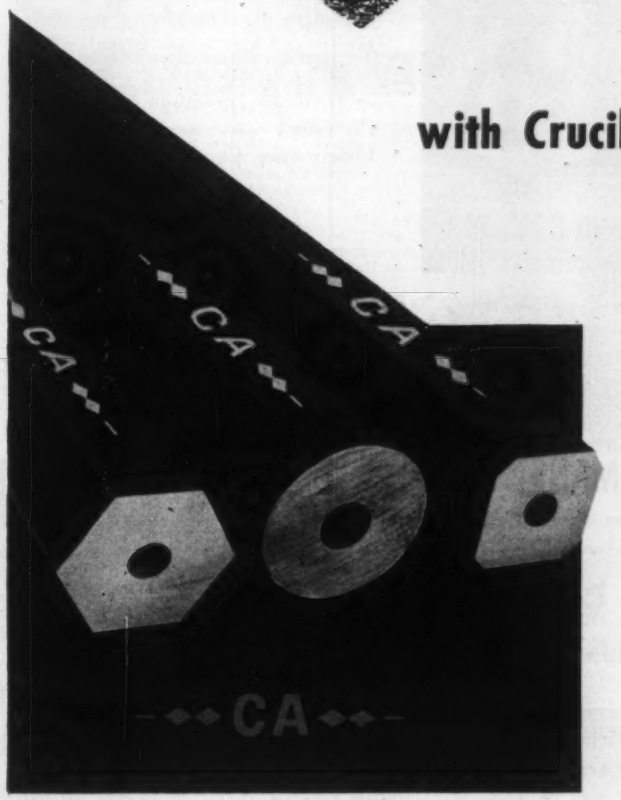
▲ **L. M. Gervasio**, 5361 Madison St., Chicago, Ill., Own Forces, $1,140,000. 60 HOMES, LOMBARD, ILL.

▲ **D & J Suburban Corp.**, 176 W. Adams St., Chicago 3, Ill., Own Forces, $6,000,000. 300 HOMES, PALATINE, ILL. A. J. Bianco, 5100 Irving Park Rd., Chicago, Ill., archt.

▲ **J. E. Merrion & Co.**, 2015 E. 79 St., Chicago, Ill., Own Forces, $3,500,000. 300 HOMES, ROBBINS, ILL.

(Continued on page 129)

Now! 300% more hole at 60% less cost...



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That's the phenomenal results construction men are getting with Crucible's new CA DOUBLE DIAMOND alloy hollow drill rods.

These new rods actually have *three times* the drilling life of ordinary carbon rods. On one major construction job CA DOUBLE DIAMOND alloy rods averaged *630 feet per rod*. And, although they are slightly higher in price, these longer-lasting rods cut costs by 60%.

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With CA DOUBLE DIAMOND, as with any alloy steel, special heat treating methods give the best results. And they'll pay off in longer rod life . . . lower drilling costs. Crucible will be glad to supply full information on CA DOUBLE DIAMOND alloy rods . . . or on its many other alloy steels for construction applications. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

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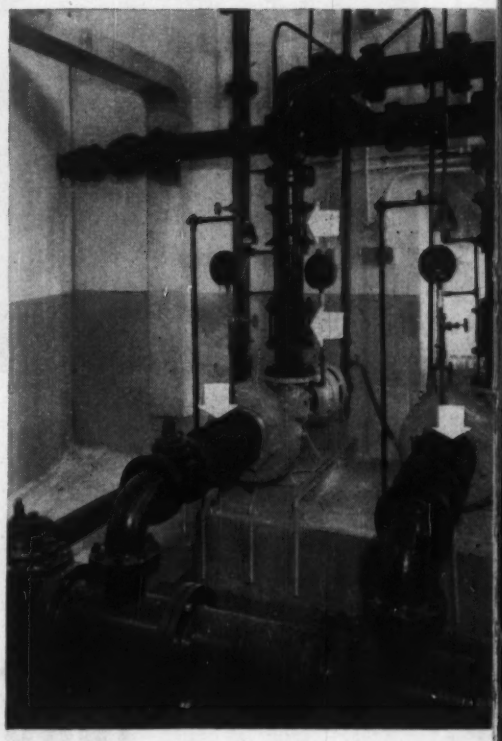
PLANNING FOR FLEXIBILITY

This modern sewage treatment plant in Murray, a suburb of Salt Lake City, has a capacity of 3 m.gd, provides screening, grit removal, sedimentation and trickling filtration. Dresser Couplings were specified to take care of movement or misalignment and for easy installation, trouble-free service. Engineering was by Headman, Ferguson & Carollo of Phoenix; construction by Barker Construction Co. of Salt Lake City.

Murray, Utah, Makes a Wise Decision

INSTALLS DRESSER COUPLINGS FOR PERMANENT, VIBRATION-PROOF PIPING



Like so many expanding communities, Murray depends on Dresser Couplings to insure low-cost pipe connections that are bottle-tight yet flexible to absorb pipe stresses.

For every Dresser Coupling has strong, resilient, wedge-shaped gaskets to cushion vibration, protect pumps from pipe-transmitted stresses, maintain no-leak sealing for life. The Dresser way cuts joining time and expenses sharply. All problems of exact pipe fitting and alignment are eliminated.

In addition, these couplings permit fast disassembly for servicing or pump replacement. Wrench-installed in but 2 man-minutes per bolt, they can be taken apart just as quickly and as easily!

Plan now to have the advantages of Dresser Couplings on your next sewerage project or water job. They've proved the truly modern way to get permanent joints and low-cost piping flexibility!

√ See your piping supplier today on how you can save on sewerage and water projects.

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Dresser Manufacturing Division, 69 Fisher Ave., Bradford, Pa. (One of the Dresser Industries). Warehouses: 1121 Rothwell St., Houston; 101 S. Airport Blvd., S. San Francisco. Sales Offices also in: New York, Philadelphia, Chicago, Toronto.

(Continued from page 126)

J. A. Utley Co., 723 E. Ten Mile Rd., Ferndale, Mich. CA Est. $400,000. TELEPHONE EXCHANGE BLDG., North Central Offices, FLINT, MICH. Michigan Bell Telephone Co., 365 Cass St., Detroit, Mich. Smith-Hinchman & Grylls, 800 Marquette Bldg., Detroit, Mich., archts.

▲ Stiles Realty Co., Walter Pezet, 1601 Eastern St. S.E., Grand Rapids, Mich. Owner Builds. $1,500,000. SHOPPING CENTER, 25 stores, Leonard St. N. W. and Remembrance Rd., GRAND RAPIDS, MICH.

Clark Constr. Co., Grand Ledge Mich. CA Est. $200,000. BUILDINGS 32C and 50A addns., LANSING, MICH. Oldsmobile Corp., General Motors Bldg., Detroit, Mich. Bids Apr. 19. CD 4/8

F. H. Taylor Co., 17360 Lahser St., Detroit, Mich. CA Est. $100,000. POWER PLANT alterations, imprvs., MILFORD, MICH. General Motors Corp., General Motors Bldg., Detroit, Mich. Argonaut Realty Div., General Motors Corp., 304 General Motors Bldg., Detroit, Mich., engrs. CD 4/21.

▲† Darin & Armstrong, Inc., 2041 Fenkell St., Detroit, Mich. CA $1,966,600. WAREHOUSE, utilities and road, PONTIAC, MICH. U. S. Eng., 600 E. Jefferson Ave., Detroit, Mich. CD 4/11.

J. R. Heineman & Sons, 1224 N. Niagara St., Saginaw, Mich. CA $207,986. 11,400 sq. ft. SERVICE BLDG. Northern Michigan College of Education, MARQUETTE, MICH. State, A. N. Langlus, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. Bids May 12. CD 4/29.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† Colo., Colorado Springs—GRADING, etc.—BA 6/7—U. S. Govt., Dpt. of Air Force, Pentagon Bldg., Wash., D. C., grading stream diversion and highway (relocate) Inv. No. AF 05-613-55-2, Air Force Academy Site. Extended date. Skidmore, Owings & Merrill, 3333 N. El Paso St., Colorado Springs, Colo., engrs. CD 5/20.

† Tex., Abilene—HEADQUARTERS—BA 6/9—U. S. Eng., 100 West Vickery St., Fort Worth, base headquarters bldg., Abilene Air Force Base, ENG-41-443-55-133. Puckett & French, Big Spring, archts.-engrs.

Minn., Madelia—BA 6/13—Village, W. Owen, clk., sewage treatment plant, storm sewer work, furnish, laying 11,400 lin. ft. 12- to 42-in. rein.-con. pipe, $173,000. Plans deposit $20 for plant, $15 for sewers. Associated Consultants, 420 Sexton Bldg., Minneapolis, engrs. CD 11/19/53.

† Texas—BA 6/13—Soil Conservation Service, First Natl. Bank Bldg., Temple, 84-55 flood water retard. structures, earthfill embankments, Sites 1 and 2, Big Cottonwood Creek approx. 5 mi. E. of N.E. of Kaufman, Kaufman Co.; 85-55, floodwater retard. structures, earthfill embankments, Sites 12 and 31, Clear Fork, Trinity River approx. 8 mi. north of Weatherford, Parker Co. Harold R. Baker, P.O. Box 417, Temple, engr.

† Nebraska—BA 6/14—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., bit. servicing for roadways and parking areas at Headquarters bldg., McCook, Spec. 701C-374.

† Ark., Blytheville—FIRING-IN-BUTT, etc.—BA About 6/17—U. S. Eng., P.O. Box 867, Little Rock, firing-in-butt, Serial No. ENG-03-050-55-128; squadron headquarters, administration and supply buildings, Serial No. ENG-03-050-55-127, Blytheville Air Force Base. CD 12/1/53.

† Montana—GAP FILLER FACILITIES—BA 6/17—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., gap filler facilities, incl. base communications bldg., gravel roads, etc., at Sweetgrass and Galata Air Force Stations, ENG-45-108-55-243.

† Kan., Salina—WATER SOFTENING PLANT—BA On Or About 6/23—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., water softening plant, Smoky Hill Air Force Base, ENG-23-028-55-93. CD 5/19/52.

▲† Mont., Glasgow—DORMITORIES—BA 6/23—U. S. Eng., City-County Airport, Walla Walla, Wash., 3 airmen's dormitories, Glasgow Air Force Base, ENG-45-164-55-34. Plans deposit $100. A. H. Miller, c/o owner, engr. CD 4/27.

Tex., Amarillo—Bids Asked—E. T. Johnson Jr., Fisk M & P Bldg., water sys. for area. $45,000.

Tex., Amarillo—Bids Asked—E. T. Johnson, Jr., Fisk M & P Bldg., general grading, earthwork, open and closed drainage. $80,000.

Tex., Amarillo—Bids Asked—E. T. Johnson Jr., Fisk M & P Bldg., earth developing and hard-paving auto parking center. $175,000. CD 3/17.

BIDS ASKED—BUILDINGS

▲ Minn., Hibbing—SCHOOL—BA 6/9—Bd. Educ., E. G. Hoskins, clk., constr. Junior High School, $2,000,000, Jyring & Whiteman, Hibbing and Haarstick, Lundgren & Assoc., 1391 First National Bldg., St. Paul, archts. CD 6/21.

Minn., Morris—SCHOOL—BA 6/16—Bd. Educ., W. W. Wieland, clk., 2 story, 66x165 ft. grade school, 25x85 ft. high school addn. $400,000. Plans deposit $25. Traynor & Hermanson, St. Cloud, archts. CD 5/1/53.

† Kan., Fort Riley—HOSPITAL—BA 6/21—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., hospital, Inv. 23-028-55-89. CD 5/9.

† N. M., Albuquerque—LIBRARY, etc.—BA About 6/23—U. S. Eng., P. O. Box 1538, main library, main exchange, warehouse, office, Sandia Base, ENG-29-005-55-61.

Minn., Montevideo—COURT HOUSE—BA 6/29—Chippewa Co., N. G. Miller, aud., court house. $600,000. Plans deposit $25. Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, archts. CD 6/22.

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THIS ONE DOESN'T WEAR ME DOWN!"

Air-operated controls — and a crane that is always ready to go to work. Torque-Controls for smooth, accurate handling . . . and almost no clutch wear or adjustment. Short wheel base and only *six tires* so that it can turn and travel in any aisle big enough *for a truck.*

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Where the going's rough and accuracy is a must, Lufkin Michigan Chain Tapes will give long, dependable service.

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The extra-tough, tinned steel line resists rust, wear, abrasion and kinking. Also available with the famous Chrome Clad finish for extra long service. Line has sturdy, formed end-ring with reinforcing strips and is easily removed from frame. Available marked in Feet, Links or Meters.

Strong steel frame has extra long winding handle. Four arm frame with "D" handle is used on tapes over 100 feet long. Large drum for fast winding.

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the most versatile "All Purpose" digger you can buy!

Before you buy any ordinary digger, see and try Acker's brand new "All Purpose" digger. For this compact, portable, moderately priced digger has everything!

New, exclusive patented features result in a more compact, lightweight unit whose speed, capacity and overall operation out-performs many larger, more expensive machines.

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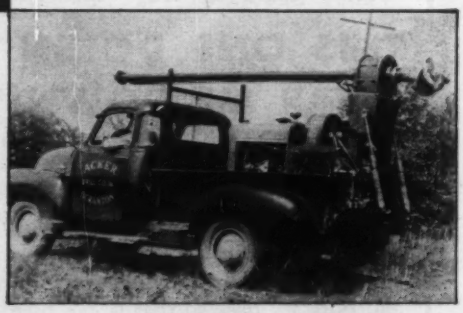

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Compare These Acker Features: PATENTED HYDRAULIC FEED • BUILT-IN HOIST & SHEAVE WHEEL • FINGER-TIP HYDRAULIC CONTROLS • RUGGED ACKER CONSTRUCTION • SPEEDY ONE MAN OPERATION • BUILT-IN REVERSE AND NEUTRAL FULL 360° OPERATING RANGE • PORTABLE, USE IT ANYWHERE COMPACT, MOUNTS ON TRUCK OR JEEP

ACKER DRILL CO., INC. 725 W. Lackawanna Avenue Scranton, Penna.

a complete line of Soil Sampling Tools, Diamond and Shot Core Drills, Drilling Accessories and Equipment

† **South Dakota**—WAREHOUSE—BA 6/30—Bureau Reclamation, Dpt. Interior, Huron, Pierre Warehouse, Transmission Div., Missouri River Basin Proj., Hughes Co., Spec. DC-4437; adv. ENR 6/2. CD 5/25/44, under Earthwork, Waterways.

▲ **Tex., Amarillo**—SHOPPING CENTER—Bids Asked—E. T. Johnson, Jr., Fisk M & P Bldg., regional shopping center. $2,500,000. CD 3/17.

SOON LETS CONTRACT—BUILDINGS

Tex., Waco—DEPARTMENT STORE—Monnig Building Co., c/o Spicer, Bush & Witt, archts.-consult. engrs., 503 Amicable Bldg., soon lets contract 3 story, bsmnt., face brick, concrete, steel department store. $350,000. Yandell, Cowan & Love Engr. Co., Fort Worth Natl. Bank Bldg., Fort Worth, engr. CD 5/11.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Henkel Constr. Co., Mason City, Ia. LB $119,126. sewage treatment plant, BUTTERFIELD, MINN. Village, E. Linschied, clk., Butterfield, Minn. Bids May 16. CD 4/27.

Minnesota Valley Improvement Co., Granite Falls, Minn. CA $85,970. road-mixed bit. surf. bit. seal coat 2.1 mi. south of Wood Lake and 3 mi. between west county line and SAR 6. 2 mi. between TH 23 at Hanley Falls and 2 mi. west, GRANITE FALLS, MINN. Yellow Medicine Co., G. L. Swanson, aud., Granite Falls, Minn. Bids May 12. CD 4/21.

M. Fruth, Rte. 2, St. Cloud, Minn. LB $80,395. grade 5.1 mi. between Hillman and TH 27, 4 mi. north of Freedhenom 3 mi. near Harding, LITTLE FALLS, MINN. Morrison Co., L. J. Billstein, aud., Little Falls, Minn. Bids May 17. CD 4/27.

V. Quackenbush, Onawa, Iowa. CA $61,021. Constr. County Ditch No. 9, MADISON, MINN. Lac qui Parle Co., A. J. Gloege, aud., Madison, Minn. Bids May 9, CD 4/20.

P. Lametti Constr. Co., 615 Drake St., St. Paul, Minn. LB $133,646. Projs. 270, 302, 313 and 317. furnish, install 10,500 lin. ft. 12- to 42-in. storm sewers, RICHFIELD (P. O. MINNEAPOLIS), MINN. Village, P. H. Haugen, clk., Richfield, Minn. Bids May 16. CD 4/27;
Lametti & Sons, 215 N. Pascal St., St. Paul, Minn. LB $82,507, Proj. 322 (Richfield, Minn.).

▲ **Foley Bros.**, New York Bldg., St. Paul, Minn. CA $1,894,767, est. $1,250,000 water filtration plant and office, ST. CLOUD, MINN. City, St. Cloud, Minn. CD 5/17, under LB.

John Hymans & Sons, Hull, Iowa., CA $95,967 concrete culverts, extensions of flumes and pipe excavation work, remove present structures, ORANGE CITY, IOWA. Sioux Co., Orange City, Iowa. Bids Apr. 12.

† **English Electric Export & Trading Co., Limited**, 23-25 Beaver St., New York, N. Y. LB $172,405. Table Rock powerhouse, furnishing 3-phase power transformer, near Branson, Taney Co., CIVENG-03-050-55-48, MISSOURI, U. S. Eng., P. O. Box 867, Little Rock, Ark. Bids May 18. CD 4/20.

▲ **MacDonald, Foster & Creighton**, 1301 S. Grand St., St. Louis, Mo. LB $8,814,500, est. $7,500,000. No. 1 bldg. engine overhall base for T.W.A. at Mid-Continent International Airport, north of Parkville, KANSAS CITY, MO. City, City Hall, Kansas City, Mo. Bids May 17. C 4/4.

Korns Electric Co., 1604 Frederick St., St. Joseph, Mo. LB $321,394. street lighting, ST. JOSEPH, MO. City, City Hall, St. Joseph, Mo. A. C. Kirkwood & Assoc., 3102 Troost St., Kansas City, Mo., engrs. Bids May 6. CD 9/9/53.

† **Secor Building Co.**, 20 N.E. 26 St., Oklahoma City, Okla. LB $234,131. Group K Bldgs., approx. 11,000 sq. yd. 17 concrete pavement access taxiways, aircraft washrack, access taxiway, concrete masonry block solvent house, 16x30 ft. gasoline standby power facilities, Sedalia Air Force Base, SEDALIA, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids May 17. CD 5/9.

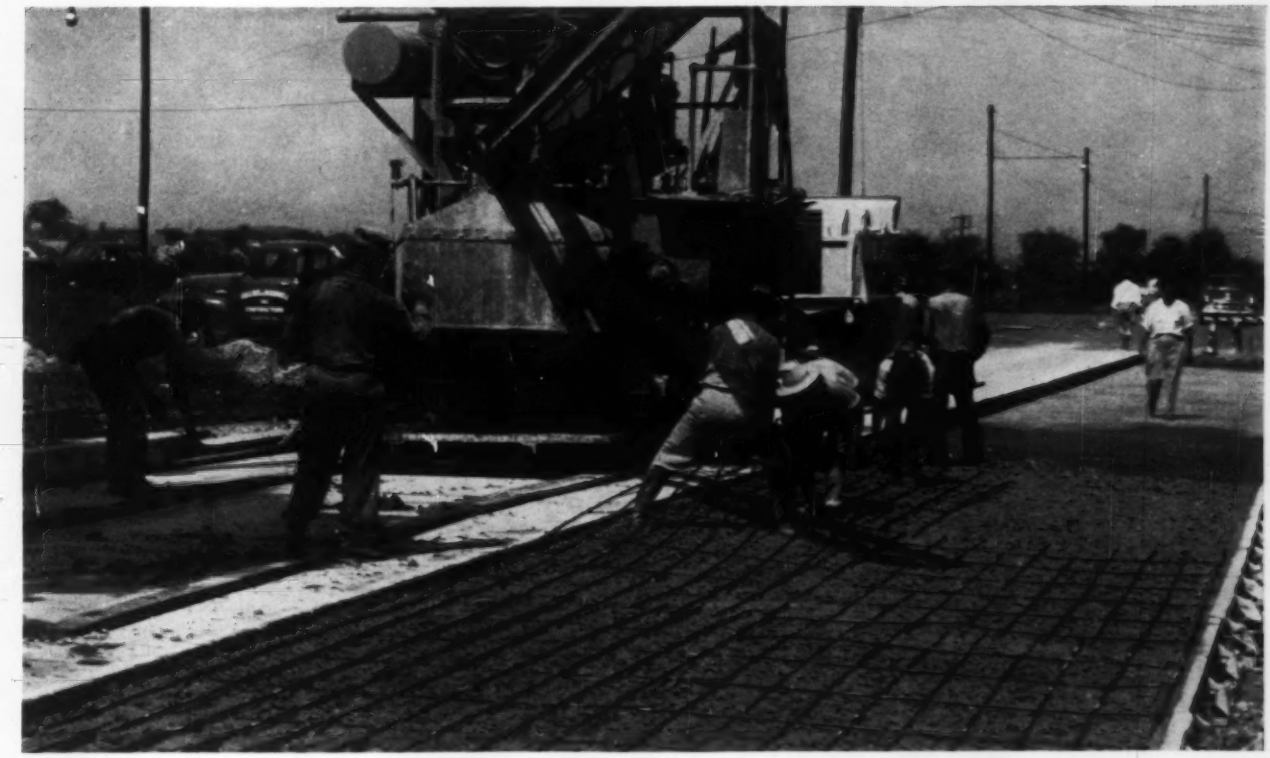
KANSAS—State Hy. Comn., Masonic Temple, Topeka,
J. A. Tobin Constr. Co., 3701 Rainbow Blvd., Kansas City, Kan. CA $102,932. c. conc. 0.035 mi. Proj. 69-46 U 083-3 (6) Part II, Johnson Co. Bids May 14. CD 5/9.

TEXAS—State Hy. Comn., Austin,
Tex.—**Harry Newton Inc.**, Graham Land Office Bldg. Graham, Tex., LB $230,187. 18 bridge extensions, approaches 1.444 mi. Hy. ST. 359, Proj. 86-2, 3&4-6, etc., Webb, Duval and Jim Hogg Counties. CD 5/11.
Tex.—**H. Ratliff**, Rogers, Tex., LB $315,820, Colorado River Bridge and approaches 0.567 mi. Hy. US 90A, Proj. F 1051 (12), Colorado Co. Bids May 18. CD 5/2.

TEXAS—State Hy. Comn., Austin,
Elmer C. Gardner, Inc., P. O. Box 19071, Houston, Tex., LB $759,667, Buffalo Bayou Bridges and approaches, grading, structures 0.292 mi. Hy. US 90A, Proj. F-512 (19), Harris Co. Bids May 17. C 5/2.

▲ **TEXAS**—State Hy. Comn., Austin,
Tex.—**Worth Constr. Co.**, P. O. Box 531, Fort Worth, Tex., LB $549,679, c. conc. 4.023 mi. Hy. US 77, Proj. 194-2-15, Cooke Co.;
Tex.—**Cooper & Woodruff**, 222 Mays Bldg., Amarillo, Tex., LB $244,416; grading, structures, base, surf. 14.208 mi. Hy. FM 283, Proj. 797-1-16, Roberts Co.;
Tex.—**L. W. Pelphrey Co.**, P. O. Box 1166, Gladewater, Tex., LB $173,315. flex. base 7 one crush. surf. tr. 0.776 mi. Hy. ST 155, Proj. C 520-5&4-8&7, Upshur and Marion Counties, C 5/5.
Tex.—**Uvalde Constr. Co.**, P. O. Box 10286, Dallas, Tex., LB $389,419, grading, storm sewers, c. conc.

(Continued on page 133)



Collins and Maxwell, Easton, Pa., lay Bethlehem fabricated bar mats on first continuously-reinforced road to be built in the East.

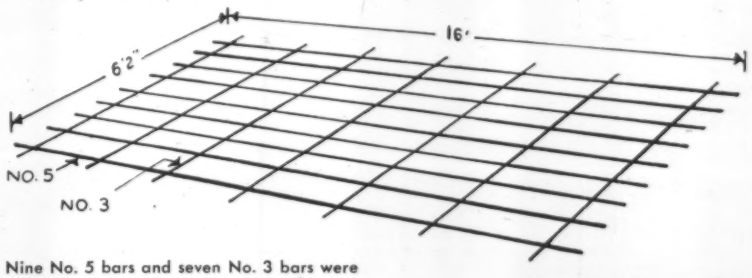
First Concrete Road in East with Continuous Reinforcement

The first concrete road in the East continuously reinforced with deformed bars was completed last fall at Bethlehem, Pa. Shop-fabricated bar mats, designed especially for this type of paving, were used in building the road.

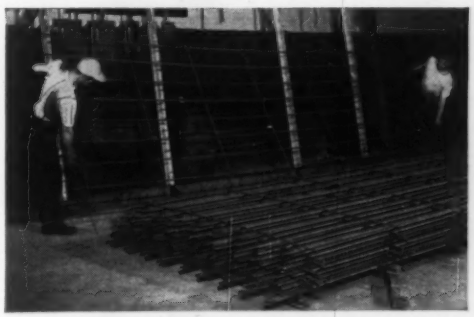
The western portion of Eaton Avenue, in Bethlehem, is a heavily-traveled stretch of road which connects the main traffic artery between Bethlehem and Allentown with U. S. Route 22, an east-west through route. Two motor cargo carriers have terminals located near Eaton Avenue, contributing largely to the heavy traffic load.

When resurfacing was necessary last year, it was decided to pave 1020 ft with an 8-in. pavement continuously reinforced with deformed bars.

No transverse contraction or expansion joints were used. Instead, specially-made mats of deformed bars were laid to form the continuous steel reinforcement. The mats, furnished by Bethlehem, weighed 180.9 lbs per 100 sq ft, and were placed after the first course of concrete was struck off just as ordinary mats are placed in reinforced concrete paving, without any necessity for accessories.



Nine No. 5 bars and seven No. 3 bars were used to fabricate bar mats for Eaton Avenue.



BAR FABRICATING SERVICE

Bethlehem can supply reinforcing bars for any type of construction project, including bar mats of any design and in any quantity. There are ten conveniently-located bar fabricating shops at your service: Boston, New York, Philadelphia, Johnstown, Pa., Baltimore, Buffalo, Detroit, Chicago, St. Paul and Seattle.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

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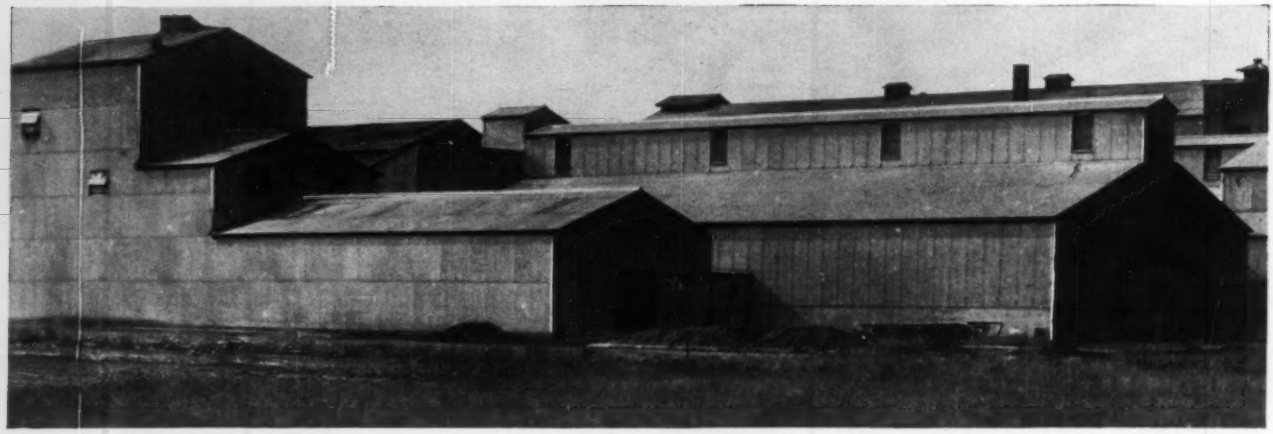
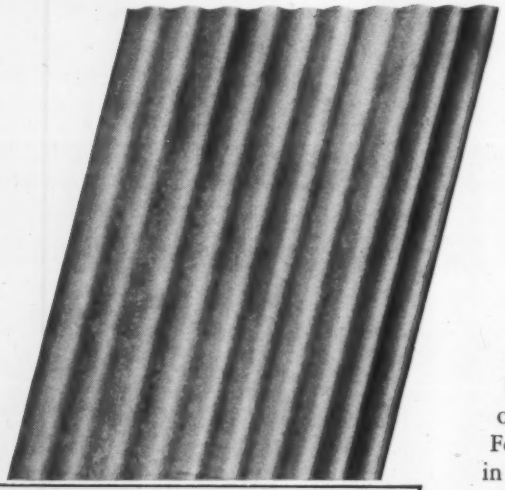


Approved Corrugated Asbestone Contractor: Kiernan-Gregory Corp., St. Louis and Chicago *General Contractor:* Charles W. Smith, East St. Louis, Ill.

Gold Bond Corrugated Asbestone helps you build FAST!



SPECIFICATIONS	
Weights and sizes:	**Standard 400**
Width	42"
Lengths	1' to 12' (in 6" increments)
Thickness	Approx. ⅛" at the crests and vales, 3/16" at flanks.
Pitch	4.2"
Weight	4 lbs. per sq. ft.
Color	Natural Cement Gray
Depth of Corrugation	1½"
Applications Specifications:	
Minimum Roof Slope	3" rise in 12"
Maximum purlin (roof) spacing	4'-6"
Maximum girt (side wall) spacing	5'-6"
Weight per net square, including side and end laps	Approx. 500 lbs.
Minimum side lap	1 corrugation (4.2")
Minimum end lap	6"
	Refer to Sweets—AIA File 12-F

When Armour Fertilizer Works, of Atlanta, Ga., decided to build a new fertilizer plant in East St. Louis, they wanted to be in business in a hurry. Gold Bond Corrugated Asbestone helped make this possible.

This material enabled them, with the use of four standard steel sections, to roof and side the entire area as one building on a single concrete slab. Within a few weeks, after the foundations and floors were completed, the building was ready for occupancy! 76,500 sq. ft. of Asbestone were used on this job. The Armour Fertilizer Works are also using it on their plant in North Kansas City, Mo.!

The rock-like surfaces of Asbestone are sturdy, incombustible and weather resistant. And, Gold Bond Corrugated Asbestone is highly economical compared to old style, high cost walls! Investigate Gold Bond "400" Asbestone for your next job.

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Send for your copy of "Corrugated Asbestone Roofing and Siding"—with full technical and application data. Write: National Gypsum Company, Dept. EN-65, P. O. Box 5257-B, New Orleans 15, La.

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LATH, PLASTER AND LIME | GYPSUM BOARD PRODUCTS | INSULATION BOARDS PLANKS AND TILES | ROCK WOOL INSULATION | PAINTS AND TEXTURES | ACOUSTICAL TILES | ASBESTOS ROOFING AND SIDING

(Continued from page 130)

pavement wid'n., b. conc. 2.272 mi. Hy. US 85, Proj. C 92-4&5-24&13, Ellis Co.;

Tex.—**R. B. Butler, Inc. & F. C. Herrling,** P. O. Box 471, Bryan, Tex. LB $143,612, grading, structures, base, surf. 11 mi. Hy. FM 950, Proj. R 928-2-1, Polk Co.;

Tex.—**Dann Pennington,** Grapeland, Tex., LB $80,786 grading, structure, base, surf. 5.679 mi. Hy. FM 1662, Proj. R 1669-4-1, Rusk Co.;

Tex.—**J. O. Boswell,** 311 Paris Ave., Lubbock, Tex., LB $282,784, ex. base, crushed surf. tr. 7.057 mi. Hy. US 87, Proj. F 546 (23) Swisher and Hale Counties, CD 5/2.

Tex.—**O. W. Howard & J. C. McLaughlin,** Madisonville, Tex., LB $98,978, grading, structures, base, surf. 5.631 mi. Hy. FM 1094, Proj. S 1785 (2) Austin Co.;

Tex.—**Austin Asphalt Co. & Austin Constr. Co.,** P. O. Box 1590, Dallas, Tex., LB $223,804 wid'n base, b. conc. 12.572 mi. Hy. US 82, Proj. F 455 (3) Baylor Co.;

Tex.—**John F. Buckner & Sons,** P. O. Box 76, Cleburne, Tex., LB, $240,995, grading, structures, base, surf. 2.096 mi. FM 1194, Proj S 1870 (1), Palo Pinto Co.; LB $138,509, grading, structures, base, surf. 9.403 mi. Hy. FM 570, Proj S 616 (2), etc. Eastland Co.;

Tex.—**Schwape Bros.,** 6633 W. Commerce St., San Antonio, Tex., LB, $143,059, grading, structures base, surf. 13.658 mi. Hy. FM-472, Proj R 849-4-4, etc. Frio Co.;

Tex.—**E. B. Darby & Co., Inc.,** P. O. Box 467, Pharr, Tex., LB, $145,622, grading, structures, base, surf. 16.698 mi. Hy. FM 1017, Proj S 1445 (2) Hidalgo Co.;

Tex.—**T. F. Jones Constr. Co.,** P. O. Box 5126, Lubbock, Tex., LB, $153,476, grading, structures, base surf. 19.957 mi. Hy. FM 303 and 597 Proj S 2025 (1), Hockley Co.;

Tex.—**Austin-Worth Constr. Co.,** P. O. Box 513, Fort Worth, Tex., LB, $166,227, b. conc. 33.467 mi. US. 96, 59, SH 21 and 26, Proj C-65-5-17 etc., Sabine, Nacogdoches, San Augustine, Shelby and Rusk Counties;

Tex.—**Menefee Brothers,** P. O. Box 413, Center, Tex., LB, $110,156, grading, structures, base, surf. 6.941 mi. Hy. FM-705, Proj. S 1161 (14) San Augustine Co. Bids May 17. CD 4/26.

▲ TEXAS—State Hy. Comn., Austin,

Tex.—**Fred Hall & Son,** Valley Mills, Tex., LB, $92,748 grav. shoulders 46.064 mi. Hy. US 277, Proj C-156 -6 & 5 etc., Baylor and Archer Counties;

Tex.—**Austin Constr. Co.,** P. O. Box 1590, Dallas, Tex., LB $100,728, soil cement shoulders, crush. surf. tr. 17.643 mi. Hy. US 287, Proj C-224-1, etc. Clay and Montague Counties;

Tex.—**Cage Brothers,** 6959 San Pedro St., San Antonio, Tex., LB, $1,091,369, grading, drainage, structures T & P R.R. overpass, flex. base, b. conc. 15.666 mi. Hy. US 80, Proj F-235 (23), etc. Ector Co.;

Tex.—**O. W. Howard & J. C. McLaughlin,** Madisonville, Tex., LB $151,606, grading, structures, base, surf. 7.007 mi. Hy. FM-1170, Proj R 735-5-1, Hopkins Co.;

Tex.—**J. R. Canion,** P. O. Box 756, Austin, Tex., LB, $86,356, grading, structures, widn. fdn. crs. and b. conc. 3.357 mi. Hy. US 75, Proj F-51-5, Madison Co.;

Tex.—**Cooper & Woodruff,** 222 Mays Bldg., Amarillo, Tex., LB $111,672. grading, structures, base, surf. 6.577 mi. Hy. FM-677, Proj. C-1352-1-2, Montague Co. CD 5/2;

Tex.—**Luce Constr. Co.,** P. O. Box 1799, Vernon, Tex., LB, $88,902, grading, structures, base, surf. 6.752 mi. Hy. FM 210, Proj. R 1956-1 and W-1 and 1, Archer and Young Counties;

Tex.—**Jn. F. Buckner & Sons,** P. O. Box 76, Cleburne, Tex., LB, $173,696, grading, structures base, surf. 11.106 mi. FM 948 and 261, Proj S-633 (2) etc., Dickens Co.;

Tex.—**M. E. Ruby,** San Marcos, Tex., LB, $115,270 grading, structures, base, surf. 7.265 mi. Hy. FM 2238 Proj. S 2037 (1), Fayette Co.;

Tex.—**Trotti & Thomson, Inc.,** P. O. Box 70, Beaumont, Tex., LB, $342,693, flex. base, b. conc. Hy. US 96 and 69, Proj. F 355 (7) and (8) Hardin Co.;

Tex.—**Angelo Constr. Co.,** P. O. Box 1057, San Angelo, Tex., LB, $166,747, seal coat 141.23 mi. Hy. US 54, SH 152, Spur 79, etc. Proj. C-238-1-10, etc. Hardley, Hutchinson, Moore, Hansford and Deaf Smith Counties;

Tex.—**Harry Campbell,** P. O. Box 836, Abilene, Tex., LB, $101,709, grading, structures, base, surf. 6.699 Mi. FM-2028, Proj S 1897 (W) etc., McCulloch Co.;

Tex.—**Menefee Bros.** P. O. Box 431, Center, and **J. C. McLaughlin,** 1305 E. 29 St., Bryan, Tex., LB, $88,931. grading, structures, base, surf. 3.347 mi. Hy. FM 2081 Proj S 1890 (1) Newton Co.;

Tex.—**Dew Constr. Co., Inc.,** P. O. Box 641, Tyler, Tex., LB, $113,335 b. conc. 18.949 mi. Hy. US 59, 69 and SH 103, Proj. C 176-4-25, etc. Polk and Angelina Counties. CD 4/26. Bids May 18.

▲ TEXAS—State Hy. Comn., Austin,

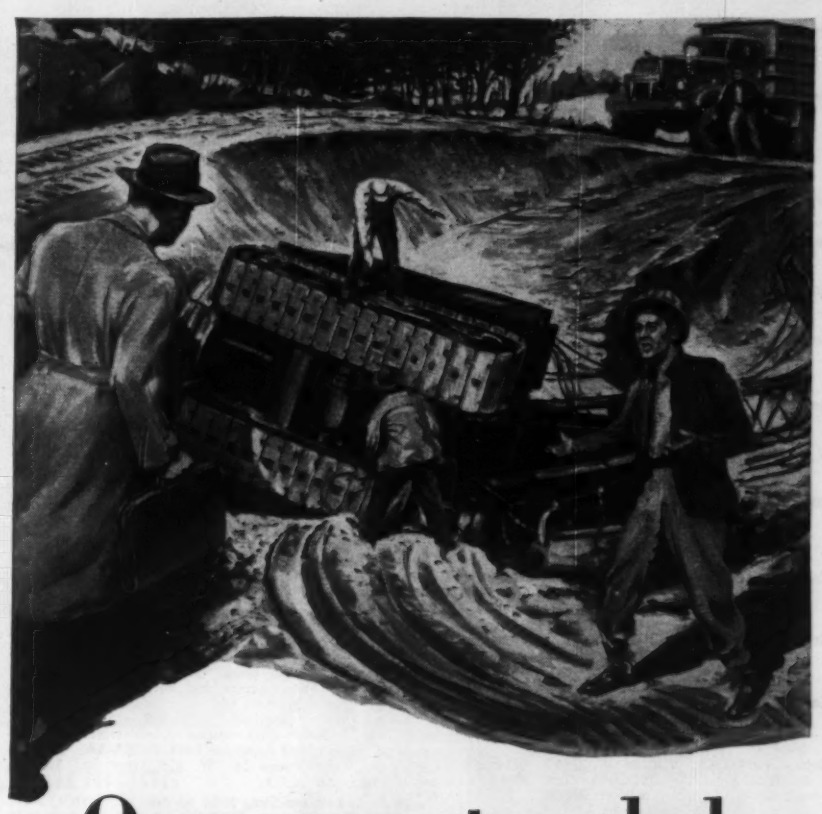
Tex.—**M. B. Killian Co. & Killian-House Co.,** 4600 Broadway, San Antonio, Tex. LB $2,748,860. flex base conc., b. conc. 5.222 mi. Proj. FI-31-(17) etc., Bexar Co.;

Tex.—**E & M Bohuskey Constr. Co.,** P. O. Box 1226, Harlingen, Tex. LB $120,400. grading, structures, base, surf. 6.526 mi. Hy. FM 508 and 597 Cameron Co.;

Tex.—**Callan Constr. Co.,** Box 3146, Westview Sta., Waco, Tex. LB $194,889 grading, structures, base, surf. 17.351 mi. FM 2005, Proj. R 1927-3-1, etc., Hamilton Co.;

Tex.—**Reynolds & Huff,** P.O. Box 88, Tyler, Tex., LB $78,025, grading, structures, base, surf. 5.337 mi. Hy. FM 2138, Proj. F 2065-L-L, Cherokee Co.;

Tex.—**F. C. Herrling,** Kurten, Tex., LB $99,628 grading, structures, base, surf. 5.982 mi. Hy. FM 2076, Proj. F 2068-1-1, Houston Co., CD 4/26.



Our crane toppled...

but it wasn't off the job for long —thanks to Hartford service!

(Based on Company File #HM-54-2869)

We were going to dredge for a small dam at a private pond. The job shouldn't have given us any trouble.

I picked what looked like a good spot to start work. George, my crane operator for 15 years, drove the machine down the slight slope.

He locked his brakes and was changing gears when the banking gave way. The crane dipped onto one track and toppled over! Somehow, George managed to scramble out safely.

There was a phone in the gas station down the road, so we put in a quick call to our Hartford Agent. He had an adjuster on the scene promptly. As a result, we lost hardly any time in getting the crane hauled out, repaired and back to our dredging job.

The bills? Our costs for salvage, new parts and labor came to $3,062.67. Under our Contractors' Equipment policy, the Hartford Fire Insurance Company paid them all!

When one of your machines is knocked out of commission, *action* is what you want.

And Hartford acts fast! Gets a man out to you promptly. Helps you get your equipment back on the job in as short a time as possible.

Make sure *you'll* have Hartford help after an accident! Write us for details . . . and a free copy of "Your Machinery and its Actual Cash Value." Or call your Hartford Fire Insurance Company Agent or your insurance broker—*today*.

Year in and year out you'll do well with the

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Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey . . . *Hartford 15, Connecticut*
Northwestern Fire & Marine Insurance Company
Twin City Fire Insurance Company . . . *Minneapolis 2, Minnesota*

Tex.—**Gulf Bitulithic Co. & F. M. Reeves & Sons of Austin,** P. O. Box 2752 Houston, Tex., LB $525,920 flex. base, c. conc. and b. conc. 1.067 mi. Hy. SH-73, Proj. FI-1052 (25), Harris Co.;

Tex.—**Austin Bridge Co. & Worth Constr. Co.,** P. O. Box 1590, Dallas, Tex., LB $1,420,553, flex. base and c. conc. 7.259 mi. Hy. SH 199, Proj. F 1102 (1), Tarrant Co. Bids May 18. CD 5/2.

† **Farmers' Implement Co.,** Blanco, Tex., LB $45,691, est. $45,000. floodwater retarding structures, Site No. 5, Dublin, Erath Co. Inv. 72-55, TEXAS. Soil Conservation Serv., First Nat'l. Bank Bldg., Temple, Tex. Bids May 13. CD 4/25.

Pedernales Electric Co-operative, San Marcos, Tex., Own Forces, $85,000, last of rural distr. lines, Hays Co., TEXAS.

Jim Wells Co., Court House, Alice, Tex., Own Forces, $150,000. general road grading, drainage, repairing, graveling, ALICE, TEX. CD 1/4.

Centex Paving Co., 217 K-W Bldg., San Antonio, Tex. LB $310,144, est. over $100,000, street and road paving in and adjacent to city, ANDREWS, TEX. Andrews Co., Andrews, Tex. Bids May 11. CD 4/27.

George Constr. Co., Box 2573, Houston, Tex. LB $130,526, Contr. 79-A-09, sanitary sewer lines, CONROE, TEX. City, Conroe, Tex. Bids May 14.

McKinney Bros. Constr. Co. Box 142, Victoria, Tex., LB $80,023, Contract 79-A-10, water mains, CONROE, TEX. City, Conroe, Tex. Bids May 14.

Centex Constr. Co., Utilities Div., 4606 Greenville St., Dallas, Tex., CA, $75,000, sanitary sewer collection lines; CA $75,000, storm sewers, GRAND PRAIRIE, TEX. Centex Constr. Co., 4606 Greenville St., Dallas, Tex. CD 4/18.

Centex Constr. Co., Utilities Div., 4606 Greenville St., Dallas, Tex., CA, $73,500. gas lines, GRAND PRAIRIE, TEX. Centex Constr. Co., 4606 Greenville St., Dallas, Tex.

Centex Constr. Co., Utilities Div., 4606 Greenville St., Dallas, Tex., CA, $48,000. site area earthwork grading, GRAND PRAIRIE, TEX. Centex Constr. Co., 4606 Greenville St., Dallas, Tex.

Centex Constr. Co., Utilities Div., 4606 Greenville St., Dallas, Tex., CA, $47,500. water lines, facilities, GRAND PRAIRIE, TEX. Centex Constr. Co., 4606 Greenville St., Dallas, Tex.

Centex Constr. Co., Utilities Div., 4606 Greenville St., Dallas, Tex., CA, $81,000, asph. paved streets, c. conc. curbs, gutters, GRAND PRAIRIE, TEX. Centex Constr. Co., 4606 Greenville St., Dallas, Tex.

Frank W. Sharp Constr. Co., 6302 Bellaire Blvd., Houston, Tex., CA, $46,115. earthwork, grading, filling, leveling of bldg. site grounds, HOUSTON, TEX. Frank W. Sharp, 3201 Oak Grove St., Houston, Tex. Frank J. Metyko, Scanlan Bldg., Houston, engr.

Frank W. Sharp Constr. Co., 6302 Bellaire Blvd., Houston, Tex., CA, $76,100. asph.-paved streets, HOUSTON, TEX. Frank Sharp, 3201 Oak Grove St., Houston, Tex. Frank J. Metyko, Scanlan Bldg., Houston, Tex., engr.

Frank W. Sharp Constr. Co., 6302 Bellaire Blvd., Houston, Tex., CA, $50,000. water lines, facilities, HOUSTON, TEX. Frank Sharp, 3201 Oak Grove St., Houston, Tex.

Frank W. Sharp Constr. Co., 6302 Bellaire Blvd., Houston, Tex., CA, $75,000, sanitary sewers, $75,000 storm sewers, open drainage, HOUSTON, TEX. Frank Sharp, 3201 Oak Grove St., Houston, Tex. Frank J. Metyko, Scanlan Bldg., Houston, engr. CD 1/26.

City, City Hall, Marshall, Tex., Own Forces, $100,000. some sanitary sewers collection lines, MARSHALL, TEX. CD 6/10/54.

City, City Hall, Marshall, Tex., Own Forces, $90,000. some water distr. lines, MARSHALL, TEX. CD 6/10.

Southwestern Bell Telephone Co., Auditorium Circle, San Antonio, Tex., Own Forces, $325,000. pole telephone lines, northern section; $250,000, eastern section; $225,000 in southern section of SAN ANTONIO, TEX. Grand total $800,000. CD 1/19.

Silsbee Golf Club, Frank McClannahan, Silsbee, Tex., Owner Builds, $75,000. 9-hole golf course, SILSBEE, TEX.

City, Spur, Tex., Own Forces, $75,000. repairing, extending municipal electric lighting system, SPUR, TEX. CD 1/21.

▲† **Pittsburgh-Des Moines Steel Co.,** Neville Island, Pittsburgh, Pa., LB, $11,767,747, est. $12,767,747, ducting and nozzle for supersonic wind tunnel at Arnold Engineering Development Center, TULLAHOMA, TEX. U. S. Eng., Tullahoma, Tex. Bids May 5. CD 2/24.

† **Williams Brothers, Inc.,** 6006 Humble Rd., Houston, Tex., LB $143,054. firing-in-butt and access taxiway, Foster Air Force Base, Inv. No. ENG-41-243-55-60, VICTORIA, TEX. U. S. Eng., P. O. Box 1229, Galveston, Tex. Bids May 17. CD 4/14.

▲ **Ebasco Services, Inc.,** 2 Rector St., New York 6, N. Y. CA Est. $79,500,000. hydro-electric plant on Clark Fork River known as Noxon Rapids Dam, incl. 190 ft. high concrete and earth-filled dam exten. nearly a mile across the river, building a powerhouse, relocation of Northern Pacific R.R. tracks and roads, moving Rural Electrification Administration's Bonneville power and telephone lines, MONTANA. Washington Water Power Co., W. 825 Trent St., Spokane, Wash. CD 12/27.

† **H. S. Leigland Sons,** 2558 38 Ave. W., Seattle, Wash. LB $561,225, est. $577,935. 2 airmen's dormitories at Great Falls Air Force Base, ENG-45-164-55-27, GREAT FALLS, MONT. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids May 17. CD 4/14.

▲ **WYOMING**—State Hy. Comn., Cheyenne,

Wyo.—**Taggart Constr. Co.,** Cody, Wyo., CA $342,178, base course surf., culvert, etc. 5.484 mi. Worland-Thermopolis Rd., F 0171 (3), Hot Springs Co.; CA $82,647 base course surf., oil tr., grav. seal coat, 5.43 mi. Willwood-West Rd., Proj. SC-CFM 3903, Park Co.;

Wyo.—**LeGrand Johnson Constr. Co.,** Logan, Utah, CA, $98,885. reshaping base, plant mix surf. seal coat 12.218 mi. Smiths Fork Rd. and seal coat 10.696 mi. Cokeville-Kemmerer Rd., Proj. S-82 (3) and State 3792 Combined, Lincoln Co.;

Wyo.—**W. E. Barling, Inc.,** Meeteetse, Wyo., CA $155,386, base course surf., oil work 3.04 mi. Lovell-Burgess Jct. Rd., crushing, stockpiling, grav. surf. 11 mi. Proj. 3831 and S.S.M.P. 4055 Combined, Big Horn Co.;

Wyo.—**A. E. and W. R. Schmidt,** Arvada, Colo., CA, $391,574, base course surf., misc. work 4.526 mi. Afton-Border Rd., Sald Creek Canyon Sec. Proj. F-184 (12), Lincoln Co.;

Wyo.—**Knisely-Moore Co.,** Douglas, Wyo., CA, $370,337, base course surf. plant mix surf. course, seal coat 1.981 mi. 8 St. Connection Road, Proj U-UI-230 (4) Laramie Co.;

Wyo.—**Platte Valley Constr. Co.,** Grand Island, Neb., CA, $445,366, base course surf., 2 rein.-con. culverts, 5.093 mi. Ranchester-Sheridan Rd., FI-179 (8) Sheridan Co. Grand total $1,885,373. Bids May 17, awarded May 18. CD 5/9.

BUILDINGS

LOW BIDS AND CONTRACTS

Fairbanks, Morse & Co., 220 E. Fifth St., St. Paul, Minn. CA, $95,000, diesel generating unit, JANESVILLE, MINN. Public Utilities Comn., Linda A. Quast, secy, Janesville, Minn. Bids May 16. CD 5/11.

▲ **Naugle-Leck, Inc.,** Baker Bldg., Minneapolis, Minn. LB Est. $5,000,000, 8 story addn. on top of present BANK and remodel existing bldg., MINNEAPOLIS, MINN. Federal Reserve Bank of the Ninth District, 75 S. Fifth St., Minneapolis, Minn. Holabird & Root & Burgee, 180 N. Wabash St., Chicago, Ill., consult. archts. Bids May 3. CD 3/24.

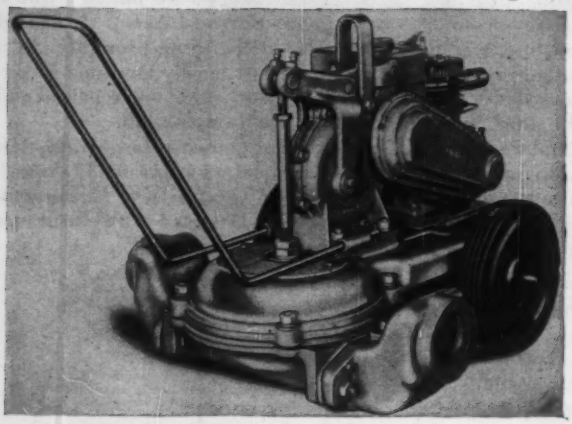
D'Arcy Leck Constr. Co., 2838 Stevens Ave., Minneapolis, Minn. CA, $910,000, general contract 6 story APARTMENT, 2201 Blaisdell Ave., MINNEAPOLIS, MINN. Caba Realty Co., c/o R. Wermsbecker, 3115 Dupont Ave. S., Minneapolis, Minn.

Fairbanks Morse & Co., 220 E. Fifth St., St. Paul, Minn. CA, $132,841, furnish, install DIESEL ENGINE GENERATING UNIT, THIEF RIVER FALLS, MINN. City, P. G. Pederson, clk., Thief River Falls, Minn. Bids May 3. CD 4/20.

▲ **L. J. McNeary Realtor,** 842½ Gravois Rd., Affton 23, Mo. Separate Contracts. $2,000,000. 160 addnl. 1 and 2 story, frame, brick, concrete RESIDENCES, in Tara Subdivision vicinity of Lavina Dr. and Baptist Church Rd. in southwestern part St. Louis County,

(Continued on page 136)

Two revolutionary new pumps announced by Construction Machinery Company, Waterloo, Iowa

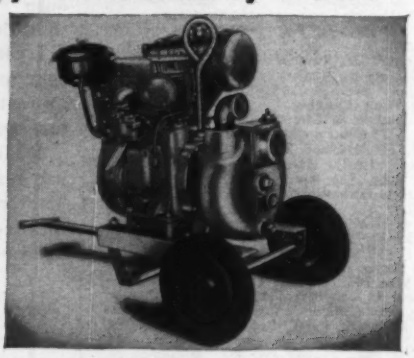


A NEW TYPE VARIABLE-SPEED, VERTICAL-STROKE PLUNGER that assures a much longer diaphragm life and greatly increased efficiency, is a real money-saving feature of CMC'S new SKWEE-GEE diaphragm pump.

A combination 2" and 3" pumper, the SKWEE-GEE is now the best pump in the business for jobs ranging from de-watering to pumping sludge. Can't be beat for high suction lifts, seepage control, small well-point dewatering jobs.

SKWEE-GEE primes dry at 25 feet. Provides total heads up to 40 feet. Standard plunger stroke 3" with alternate 2¾" by simple adjustment. Briggs air-cooled engine.

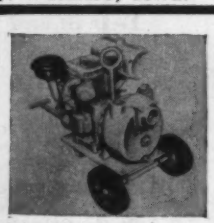
Write for Bulletin FD-L3-55. **Construction Machinery Company,** Waterloo, Iowa.



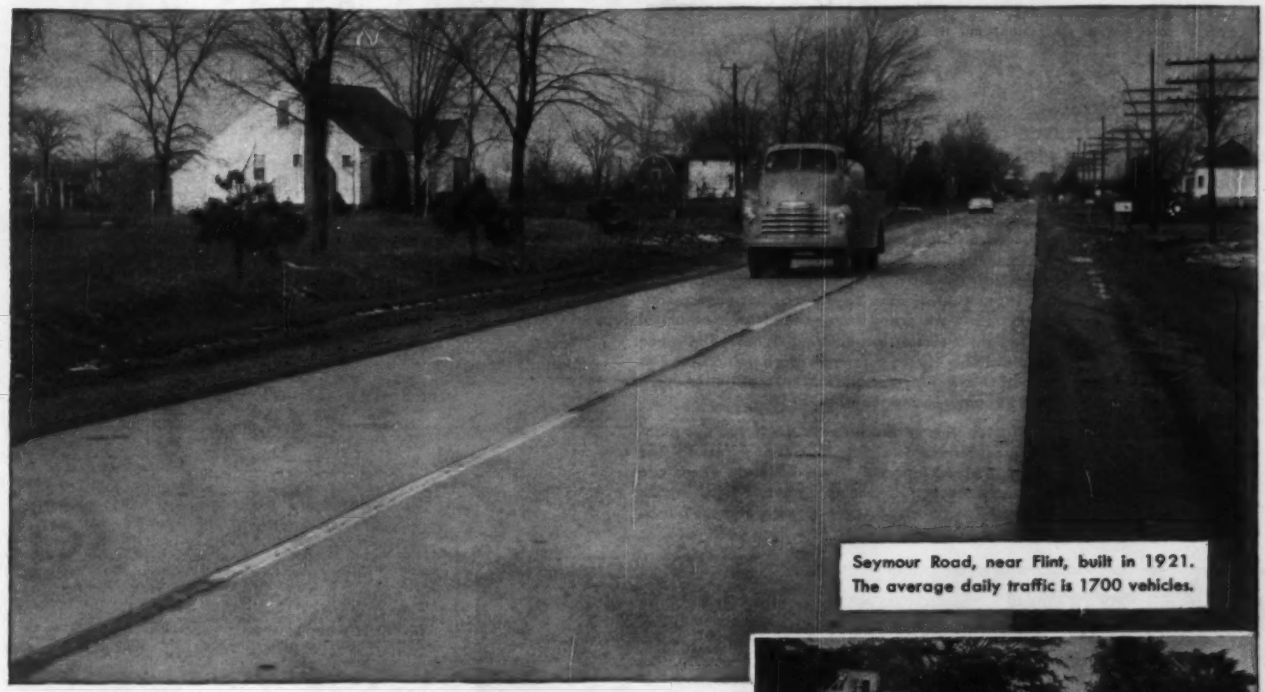
TWICE THE PRESSURE of ordinary single impeller pumps is delivered by CMC'S new and different 2-stage dual primer, Model TS-7.

A 1½" pumper with unique type impeller, it's excellent for such jobs as pumping through extended lines and washing equipment. Fine for suction lifts up to 25 feet.

Write for Bulletin TS-7, **Construction Machinery Company,** Waterloo, Iowa.



A Complete Line of Dual Primers from 1" to 10"



Seymour Road, near Flint, built in 1921. The average daily traffic is 1700 vehicles.

"In Genesee County, Michigan we get the most for our money with CONCRETE ROADS"

"After a generation of heavy-duty service, our highways can tell a story of vital interest to everyone concerned with roads," writes J. T. Sharpensteen, Engineer for the Genesee County (Mich.) Road Commission.

"All but a few short stretches of the 120 miles of concrete roads we built during the 1920's are still in good condition, adequate for many more years of service. This service record is especially noteworthy because Genesee County is the hub of a vast automobile manufacturing empire, where the traffic is always heavy.

"The non-concrete roads, however, have needed such extensive maintenance that we had to rebuild them rather than exhaust our funds in frequent patching and repairs.

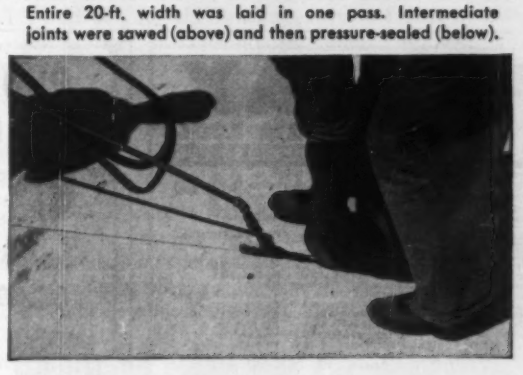
"One troublesome non-concrete road cost $952 per mile for patching alone in 1952. Patching on another non-concrete road cost $1315 per mile. In contrast, the yearly average maintenance cost on our concrete pavements was only $120 per mile—about one-tenth as much!

"Repaving these two roads with concrete solved our problem. Three of the four bids for concrete were lower than the lowest bid for the alternate type of pavement."

Yes, concrete pavement usually costs less to build than other types *designed for the same traffic,* and its average maintenance cost is less. Over long years of service that means ***low annual cost.*** Write for free copy of maintenance cost data, distributed only in the U.S. and Canada.

New 8-in. concrete paving being laid over old flexible road. Wedges of sand were used to level old high crown.

Entire 20-ft. width was laid in one pass. Intermediate joints were sawed (above) and then pressure-sealed (below).



PORTLAND CEMENT ASSOCIATION Dept. A6a-17, 33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

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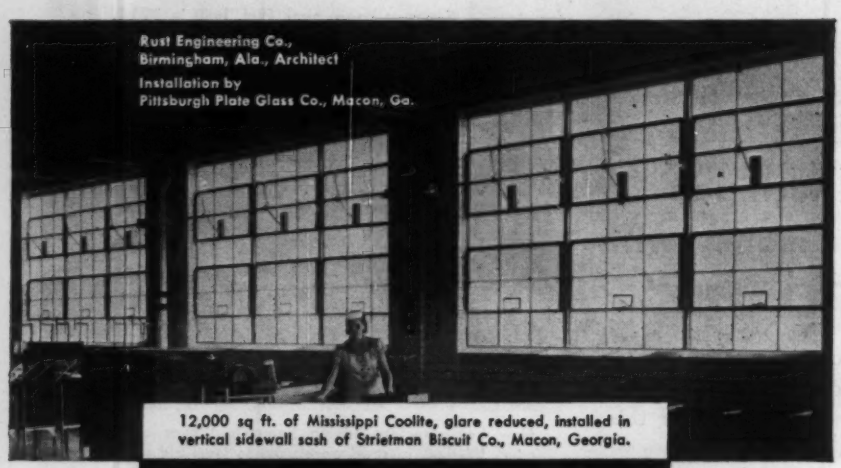
Extensive use of Coolite, the Heat Absorbing Glare Reducing Glass, enables the Striefman Biscuit Company to brighten this modern plant with copious quantities of natural illumination at low cost, yet keep interiors cooler, more comfortable. For Coolite's amazing ability to absorb up to 50 per cent of solar rays keeps this unnecessary and unwanted heat from work areas, lessens need for mechanical cooling. And Coolite light is comfort-conditioned as well. The glare reduced glass makes seeing easier, cuts harsh glare that causes eye fatigue and visual errors. Employees see better, feel better, work better under Coolite's cooler, better light.

Coolite can help brighten your production picture. If you are planning to expand or modernize facilities, it will pay you to find out how Coolite, Heat Absorbing and Glare Reducing Glass can increase efficiency and economy. Coolite's filtered light boosts employee morale, reduces rejects. Specify Coolite, famous Mississippi Glass.



12,000 sq ft. of Mississippi Coolite, glare reduced, installed in vertical sidewall sash of Striefman Biscuit Co., Macon, Georgia.

Translucent light diffusing glass by Mississippi is available in a wide variety of patterns and surface finishes "visioneered" for any daylighting requirement. Sold by leading distributors everywhere.

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PHOENIXVILLE, PA.

Subsidiary—Barium Steel Corporation

(Continued from page 134)

incl. streets, sewers, AFFTON (ST. LOUIS 23 P.O.), MO.

John Herdlein & Bumiller & Meyersieck, 2604 Cherokee St., St. Louis 18, Mo. Separate Contracts. $500,000, 50 RESIDENCES in Oak Crest subdivision on Oak Ridge Ave. south of Big Bend Blvd. vicinity of Rayburn and Spellman Aves., CRESTWOOD (ST. LOUIS 23 P. O.), MO.

Contemporary Homes, Inc., 8587 St. Charles Rock Rd., St. Louis, Mo. Owner Builds. $500,000. 47 addnl. RESIDENCES in Robinwood Subdivision on Derhake and Washington Rds. adjacent to U. S. No. 66, FLORISSANT, MO.

Millstone Constr. Co., 8510 Eager Rd., Brentwood 17, Mo. CA, 2 story, brick, 24x105 ft. drive-in BANK with 24x105 ft. canopy, 8 and Lucas Ave. with underground pneumatic tube 600 ft. long to main bldg., ST. LOUIS, MO. Mercantile Trust Co., Kenton R. Cravens, pres., 8 and Locust Sts., St Louis, 1, Mo. Russell, Mullgardt, Schwarz & Van Hoefen, Chemical Bldg., 721 Olive St., St. Louis 1, Mo., archts.

▲ **Frank E. Zykan, Inc.**, 8684 Kathlyn Ave., Overland 14, Mo. Separate Contracts. $3,000,000. 300 ranch-style HOMES in Woodson Gardens on 47 acre tract Edmundson Rd. north of St. Charles Rock Rd., incl. sewers, roads, walks, utilities, ST. LOUIS COUNTY, MO. CD 11/19.

▲ **Frank Baum**, Pleasant Hope, Mo. and **O. T. Gillenwaters & Son**, 1950 Collinson St., Springfield, Mo. Owner Builds. $1,000,000, 105 HOUSES, Cherry St. and Mills St., Beechwood Heights, SPRINGFIELD, MO.

Paul O. Johnson, 1218 S. National St., Springfield, Mo. Owner Builds. $450,000, HOUSING, adjoining Parkview Addn. east of Frisko Line, SPRINGFIELD, MO.

Yellow Transit Truck Lines Co., Baxter Springs, Kan. rejected bids May 4, overhaul BASE, BAXTER SPRINGS, KAN. CD 5/3.

Douglas Constr. Co., 510 E. 15 St., Topeka, Kan. LB $429,000, general contract parking GARAGE, TOPEKA, KAN. City, City Hall, Topeka, Kan. Bids May 10. CD 4/27.

Anderson Constr. Co., 445 14 St., Beaumont, Tex., Owner Builds. $365,000, 23 brick veneer DWELLINGS, concrete slab fdn.; $382,125, 30 part-masonry DWELLINGS, concrete slab fdn, BEAUMONT, TEX. CD 2/25.

Rob. Connor & Wallace A. Phillips, 598 Canadian St., Houston, Tex., Owner Builds, $367,450, 32 DWELLINGS, BELLAIRIE, TEX. CD 3/2.

Lewis & Lamberth, Builders, 3918 Gaston St., Dallas, Tex., Owner Builds, $345,150, 48 low-cost DWELLINGS, DALLAS, TEX. CD 3/10.

Keele-Jones Constr. Co., 2911 S. Lancaster St., Dallas, Tex., Owner Builds, $370,600. (c) 25 DWELLINGS, $351,175, (d) 20 DWELLINGS, DALLAS, TEX. CD 3/9.

Tips Constr. Co., 701 Forest Ave., Dallas, Tex., Owner Builds, $355,500. 15 brick DWELLINGS: $365,000, 16 all-masonry DWELLINGS, DALLAS, TEX. CD 3/4.

Wyatt A. Johnson, 7800 N. Loop Rd., El Paso, Tex., Purchase and Hire, $370,000. 31 addnl. DWELLINGS, EL PASO, TEX. CD 3/8.

† **Dan R. Ponder, Inc.**, 327 Morgan Ave., El Paso, Tex., CA, $96,071. expansion to ORDNANCE AMMUNITION STORAGE areas, Fort Bliss, EL PASO, TEX. U. S. Eng., Office of Post quartermaster, Purch. & Contg. Div., Fort Bliss, Tex. CD 7/6/51.

Laverne Goodwin, Garland, Tex., Force Account, $368,150, 28 DWELLINGS, GARLAND, TEX. CD 3/2.

Powell Constr. Co., c/o owner, CA, $350,000. 22 DWELLINGS: CA $375,000. 25 DWELLINGS, GARLAND, TEX. Virgil Powell, Garland, Tex. CD 3/2.

▲ **Centex Constr. Co.**, 4606 Greenville St., Dallas, Tex., Owner Builds, $355,000. Group 20, 28 DWELLINGS: $345,500, Group 22, 25 DWELLINGS; $392,075, Group 23, 39 DWELLINGS, GRAND PRAIRIE, TEX. Grand total $1,029,575. CD 2/2.

Inwood Terrace, c/o Sterling Hogan, Sr., 7525 South Park St., Houston, Tex., Owner Builds, $373,415. 38 DWELLINGS, HOUSTON, TEX. CD 3/11.

N. E. Kennedy & Son, Contractor, First Natl. Bank Bldg., Houston, Tex., CA, $363,115. 12 brick DWELLINGS, conc. slab fdn.; CA $379,000, 16 all-masonry DWELLINGS, near HOUSTON, TEX. Clark W. Henry, Developer, c/o N. E. Kennedy, First Natl. Bank Bldg., Houston, Tex. CD 3/11.

Perrin White Lumber Co., 3634 Durness St., Houston, Tex., CA, $348,525, 22 DWELLINGS: CA, $405,500, 38 DWELLINGS, near HOUSTON, TEX. Perrin White & Assocs., 3634 Durness St., Houston, Tex. CD 3/1.

Truett Peachey Constr. Co., 1220 Polk St., Houston, Tex., CA, $515,000, 29 all-masonry DWELLINGS, HOUSTON, TEX. Truett Peachey, Developer, 1220 Polk St., Houston, Tex. CD 3/2.

Homes Beautiful, Inc., c/o McDermed St., Houston, Tex., Owner Builds. $372,400, 36 DWELLINGS: $366,225, 31 DWELLINGS, HOUSTON, TEX. CD 2/28.

▲ **Brown & Root, Inc.**, Box 3, Houston, Tex., CA, Est. $16,500,000, paper mfg. PLANT; CA, Est. $375,000, WAREHOUSING, HOUSTON, TEX. United Gypsum Co. of Chicago, 300 W. Adams St., Chicago, Ill. CD 3/29.

F. W. Sharp Constr. Co., 2202 Rosslyn St., Houston, Tex., CA, $323,000, 25 DWELLINGS: CA, $368,700, 37 DWELLINGS, HOUSTON, TEX. Frank W. Sharp, 2202 Rosslyn St., Houston, Tex. CD 6/4/54.

Kimmey Constr. Co., 7710 Junior St., Houston, Tex., CA, $373,000, 28 DWELLINGS: CA, $367,120, 24 DWELLINGS, HOUSTON, TEX. D. A. McKimmey, 7710 Junior St., Houston, Tex.

A. A. Shepherd, 2200 Nacogdoches Rd., San Antonio, Tex., Owner Builds, $371,100, Sec. (4), 32 DWELLINGS; $385,115, Sec. 5, 38 DWELLINGS, SAN ANTONIO, TEX. CD 2/25.

Riedesel-Lowe Co., 501 E. 15 St., Cheyenne, Wyo., CA, $97,800, 81x102 ft., HY. MAINTENANCE STOR-

(Continued on page 139)

Form and Pour 75 ft. diameter tank 26 ft. high in 8 hours!

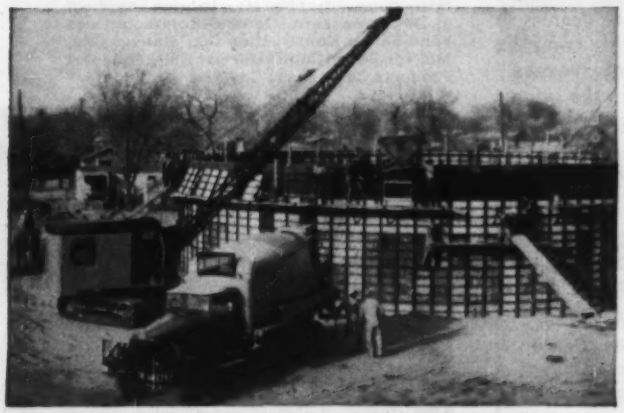
9:30 am POURING started at 8:00 am.
6 ft. of concrete in place.

How a contractor formed and poured a circular tank 75 ft. in diameter with walls 26 ft. high and 14 inches thick in 8 hours, with maximum economy makes the concrete forming speed story of the year.

The tank was formed and poured by the contractor, C. H. Leavell & Co., El Paso, Texas, in record time, and a tough forming specification limiting maximum free drop of concrete to 4 ft. was rigidly adhered to.

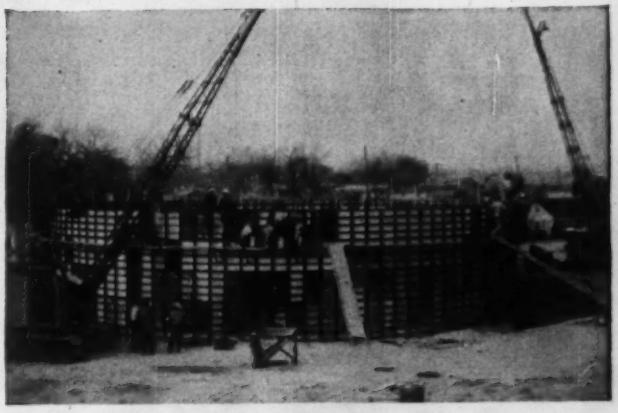
11:30 am FORMING AND POURING were in full production at the 10-ft level.

UNI-FORM Concrete Forms — the prefabricated, ready to use form panels — were used on the job. Because UNI-FORMS erect into a tight, rigid, automatically accurate form requiring alignment and bracing on 1 side only, the contractor conceived the idea of simultaneously forming and pouring the wall. Universal Form Clamp Co. engineers on the job agreed that the plan was feasible.



4:00 pm POURING at 22-ft level. Scaffold setters on final placement.

Rigidity of the steel-framed, plywood faced UNI-FORMS permitted fast, non-stop erection of the entire inside form. This permitted setting of reinforcing steel, outside forming, and concrete placement to proceed with maximum efficiency, speed and safety. The outside of the tank was formed using 5 lifts of 4 ft. and 2 lifts of 3 ft. UNI-FORM Panels. In this way, the concrete never dropped more than the specified 4 ft. below the height of the outside form.



4:45 pm UNI-FORMS now completed

5:15 pm Final concrete poured.

As successive pours were completed, the outside form was closed by setting the UNI-FORM Panels in place and locking them to the projecting UNI-FORM Ties. UNI-FORM Circular Wall Fillers, which member with UNI-FORM Panels, permitted forming the curve of the wall to specifications. Automatically accurate wall widths were insured, as the UNI-FORM Ties spread and locked the face of the Panels exactly 14" apart. UNI-FORM Scaffold Brackets, which fasten directly to the steel UNI-FORM frame, provided fast, low cost scaffolding.

The result? Under the capable direction of job superintendent Paul Nigh and project manager N. J. Riebe — fast, low cost forming and pouring — an accurate, smooth faced wall with true curvature.

UNI-FORM Panels are versatile, high speed forming tools. They're used by the country's most successful contractors to form every conceivable type of construction. They are rented or sold . . . or rented with purchase option. Universal Distributors and Branches are located from Coast-to-coast. Write for UNI-FORM Catalog and complete details on UNI-FORMING — the *modern* way to form concrete.

UNIVERSAL FORM CLAMP CO.
1238 North Kostner Avenue • Chicago 51, Illinois

FOAMGLAS®

the cellular, stay-dry insulation

Underground quarry's 2,500-carload freezers stay dry because FOAMGLAS is moisture-proof

In a nine-acre *underground* limestone quarry below a 175 ft. overburden, Inland Cold Storage Company, Kansas City, Kansas, can store 2,500 carloads of frozen foods! "Our cave was a natural for this," Inland President Leonard H. Strauss points out. "A year-round temperature of 55°F cut in half our costs for refrigeration and construction. With naturally insulated ceilings and floors, only walls were needed to complete our 16 storage rooms.

"We had one tough problem. Although this is a 'dry cave,' on a hot, humid day the relative humidity inside the undeveloped area may reach 85%. But this moist air won't get into any of our freezers or coolers because their walls are insulated with moisture-proof FOAMGLAS. It's the one insulation that'll stay constantly efficient, making refrigeration failure a minor problem. We'd lose only two or three degrees in our zero degree rooms with a complete refrigeration breakdown for two weeks."

You can benefit too from the unique properties of this waterproof, strong, vermin-proof insulation. Please write today for our booklets with complete technical and specification data for cold storage insulation.

Pittsburgh Corning Corporation
Dept. K-65, One Gateway Center
Pittsburgh 22, Pennsylvania
In Canada: 57 Bloor St. W., Toronto, Ontario

450,000 bd. ft. of FOAMGLAS was very easy to install... five inches thick on walls between the rooms and six inches, double coursed on perimeter walls. 15,000 ft. of FOAMGLAS pipe insulation was applied later to brine lines held at 24° below zero. General Contractor was Winn-Senter Construction Co., Kansas City, Mo.; Insulation Contractor was Kelly Asbestos Products Co., Kansas City, Mo.

(Continued from page 136)

AGE BLDG., at Buffalo, Johnson Co., WYOMING, State Hy. Comn., Cheyenne, Wyo. Bids May 17, awarded May 18. CD 5/9.

Weaver Constr. Co., 5555 E. Evans St., Denver, Colo., CA, $491,732, general contract Horace Mann JUNIOR HIGH SCHOOL addn., DENVER, COLO. School District No. 1, 414 14 St., Denver, Colo. Bids Apr. 27, awarded May 12. CD 5/4, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Oregon**—BA 6/16—Bureau Reclamation, Dpt. Interior, 33 N. Riverside St., Medford, 4 mi. lake dam and fish lake dam rehabilitation, Medford Irrigation District Proj., Spec. 100C-223.

† **Wash., Spokane**—WAREHOUSE, etc.—BA 6/20—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 48x128 ft. masonry bulk supply warehouse and 60x128 ft. masonry recreation facility yith utilities, Deep Creek Air Force Station, ENG-45-108-55-242.

† **Washington**—MILITARY INSTALLATION—BA 6/27—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, clearing, constr. roads, revetment, 88x30 ft. mess hall, and 30x40 ft. assembly and test bldg., etc. for military installation, ENG-45-108-55-241. Plans deposit $100. CD 4/15.

† **Idaho**—BA 7/7—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo. Sch. 1, Item 1, 1 control board; Item 2, one cabinet; Sch. 2, Item 3, 5 distribution boards, Sch. 3, Item 4, 5 distribution boards; Item 5, 3 distribution boards, Item 6 one distr. board; Sch. 4, Item 7, battery chargers, for Palisades Power Plant, Palisades Proj; Spec. DS-4429. L. N. McClellan, ch. engr. CD 9/14/44.

BIDS ASKED—BUILDINGS

Calif., West Covina—HOSPITAL—BA 6/10—Lark Ellen Hospital, Inc., c/o Nielsen & Moffatt, archts., 4072 Crenshaw Blvd., Los Angeles, 43-bed, frame, stucco brick, hospital $650,000.

▲ **Calif., Los Angeles**—COURT HOUSE—BA 7/19—Los Angeles Co., Hall of Records, Los Angeles, county court house, First and Hill Sts., $14,519,000. Extended date. CD 5/6.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

UTAH—State Road Comn., Salt Lake City,
W. W. Clyde & Co., Springville, Utah, CA, $572,843, est. $602,662, plant mix bit. surf., 2 concrete bridges 7.4 mi. Moab North and South, Grand Co. Bids Apr. 12. CD 5/3, under LB.

▲† **C. H. Leavell Co.**, 1900 Wyoming St., El Paso, Tex. and **Utah Constr. Co.**, 100 Bush St., San Francisco, Calif. LB $3,651,000. joint venture. addnl. aviation facilities, FALLON, NEV. P. Wks. Officer, Twelfth Naval Dist., San Bruno, Calif. Bids May 18. CD 4/26.

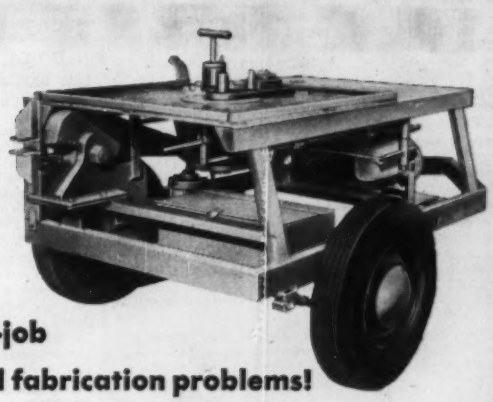
WASHINGTON—State Hy. Comn., Olympia,
Louis Elterich Co., P. O. Box 868, Port Angeles, Wash., LB, $146,853, rein.-con. girder bridge over Spokane River, 0.078 mi. Harvard Rd. Spokane Co. Bids May 17. CD 5/3.

WASHINGTON—State Hy. Comn., Olympia,
Wash.—**Associated Sand & Gravel Co.**, 2508 Colby St., Everett, Wash., LB, $87,259, bit. surf., surf. 30.11 mi. State Hys. 1-L-C and 1-F, Skagit and Whatcom Counties;
Wash.—**F. H. Deatley**, Salsberg Bldg., Lewiston, Idaho, LB, $239,527, reconstr. shoulders and ditches, bit. 11.3 mi. Secondary State Hy. 3-F, Whitman Co.;
Wash.—**N. A. Degerstrom Co.**, Spokane, Wash., LB, $430,604. draining, grading 2.359 mi. primary State Hy. 2, Spokane Co.;
Wash.—**Columbia Asphalt Paving Co.**, Yakima, Wash., LB, $245,005. b. conc. paving 3.61 mi. Primary State Hys. 7 and 10 in Quincy, Grant Co. Bids May 17. CD 5/3.

CALIFORNIA—State Div. Hys. P. Wks. Bldg., Sacramento,
G. M. Carr Co. & Bati Rocca, 2333 Burbank Ave., Santa Rosa, Calif., LB, $88,791. steel girder bridge across Middle Fork of Smith River, Fed. Aid Sec. County Rte. 985, Del Norte Co. Bids May 18. CD 4/22.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,
Calif.—**Frederickson & Watson Constr. Co.**, 873 81 Ave., Oakland, Calif., LB $786,667 grading, surf. 3.7 mi. U. S. 101, Santa Barbara Co.;
Calif.—**Ben C. Gerwick, Inc.**, 112 Market St., San Francisco, Calif., LB, $842,406, grading, surf. 2.5 mi. U. S. 101, Humboldt Co.;
Calif.—**Pyramid Constr. Co.**, 29 E. 1 St., Reno, Nev., LB, $222,762, grading, surf. 8.1 mi. Fed. Aid Sec. Route 1093 Mono Co. 1. CD 4/22;
Calif.—**W. H. O'Hair Co.**, 1112 Main St., Colusa, Calif., LB, $112,830, surf. portions 3.8 mi. Sign Route 45 Colusa Co. CD 4/27.
Calif.—**Granite Constr. Co.**, P. O. Box 900, Watsonville, Calif., LB, $98,873, surf. 16.7 mi. Sign Rte. 16 and US 99 W, Yolo and Colusa Counties;
Calif.—**Wm. S. and Bruce F. Rogers Co.**, 200 Pine St., Madera, Calif., LB, $85,285, surf. 6.8 mi. Fed. Aid Sec. County Route 1089, Siskiyou Co. CD 4/22. Bids May 18.
▲† **Clyde W. Wood & Sons, Inc.**, Box 620, North Hollywood, Calif., LB, $1,479,623, imprv. Los Angeles River, Carson St. to Wardlow Rd., River Mile 4.63 to Mile 3.78, Long Beach, Los Angeles Co., CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 20. CD 5/3.

here it is...



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No shaking necessary. Particles electro-polarized to prevent settling. Uniform color throughout bottle . . . always. *Completely opaque, uniformly black.* No grey areas. No chipping or peeling.

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Please send me a FREE SAMPLE of Carter's New Squeeze Bottle India Ink.

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Company_____
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City_____ State_____

▲† **A. Teichert & Son**, Box 397, Baldwin Park, Calif., LB, $2,377,771, imprv. Los Angeles River from River Mile 10.48 to 9.34 mi., CIVENG-04-353-55-39, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 19. CD 10/13/54.

Vincent Rodriguez, 202 Jackson St., Hayward, Calif., LB, $109,462, installing 8,500 ft. rein.-con., vitr. clay sewer pipe, sewerage separation unit, BERKELEY, CALIF. City, City Hall, Berkeley, Calif.

▲ **Baker & Erson Co.**, 12420 S. Bloomfield Ave., Norwalk, Calif., LB, $1,723,681, Santiago Lateral of Colorado River Aqueduct Distribution Sys., Orange, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern Calif., 306 W. 3 St., Los Angeles, Calif. Bids May 19. CD 5/6.

▲ **Guy F. Atkinson Co.**, Box 259, Long Beach, Calif., LB, $1,086,523, rein.-con. conduit in Los Cerritos Channel from Palos Verdes Lateral to Atherton St., LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2550 Alcazar St., Los Angeles, Calif. Bids May 13. CD 4/20.

▲† **James Stewart Co.**, 425 N. Central Ave., Phoenix, Ariz., LB, $1,678,448 research laboratory facilities, Edward Air Force Base, ENG-04-353-55-148, MUROC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 20. CD 5/9.

McGuire & Hester, 796 66 Ave., Oakland, Calif., LB, $313,313, installing 2- to 16-in. diam. water mains, Alameda and Contra Costa Counties, OAKLAND, CALIF. East Bay Municipal Utility Dist., 512 16 St., Oakland, Calif.

▲† **Pacific Bridge Co.**, 256 Montgomery St., San Francisco, Calif. LB, $1,000,000. reconstr. Wharf No. 3, NOY 867,29, Spec. 45840, PORT HUENEME, CALIF. Dpt. Navy, Eleventh Naval Dist., San Diego, Calif. Bids May 17. CD 4/26.

M & K Corp., 405 Montgomery St. San Francisco, Calif., LB, $680,900. Caddlestick Point Tunnel Collecting Sewers, SAN FRANCISCO, CALIF. City and San Francisco Co., Dpt. P. Wks., City Hall, San Francisco, Calif. CD 7/1.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Christiansen Brothers**, 209 W. 13 St., Salt Lake City, Utah, CA, $1,894,000; WOMEN'S RESIDENT HALLS, PROVO, UTAH. Brigham Young University, Provo, Utah. Bids Apr. 6. CD 4/26, under LB.

Forney Fruit & Produce Co., Yakima, Wash., Day Labor, $200,000. cold storage and produce WAREHOUSE, QUINCY, WASH.

▲ **Andersen-Westfall Co.**, 2470 N.W. Nicolai St., Portland, Ore. CA Est. $1,600,000. glass FACTORY and WAREHOUSE, PARKROSE, ORE. Owens-Illinois Glass Co., 601 36 Ave., Oakland, Calif. Bids May 17. CD 4/28.

Geo. Irwin, Canby, Ore. CA $501,783. HIGH SCHOOL addn., WEST LINN, ORE. West Linn School Dist., West Linn, Ore. Annand, Boone & Lei, 1530 S.W. Taylor St., Portland, Ore., archts. Awarded May 12. CD 3/1.

Jos. Bettancourt, 1015 San Mateo Ave., San Bruno, Calif., LB, $666,494, 50-bed HOSPITAL, PETALUMA, CALIF. Petaluma District Hospital, Petaluma, Calif. Bids May 16. CD 4/12.

Cal-Central Constr. Co., 7500 14 Ave., Sacramento, Calif. LB $440,825, 64 portable elementary classrooms, SACRAMENTO, CALIF. Sacramento City Unified School Dist., 161 9 N. St., Sacramento, Calif. Harry J. Devine, 1012 Jay St., Sacramento, Calif., archt. CD 2/18.

Henderson Constr. Co., 33 Ritch St., San Francisco, Calif., LB, $669,000. Commodore Stockton SCHOOL, SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids May 18. CD 4/26.

▲ **Johnson, Drake & Piper, Inc.**, 9009 San Leandro St., Oakland, Calif., CA, $2,294,300, general contract 2nd phase Units 4 and 5, California MEDICAL FACILITY, VACAVILLE, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids May 10, awarded May 17. CD 5/16, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., Hamilton—WHARF—BA 6/8—Dpt. P. Wks., Hunter Bldg., Ottawa, wharf reconstr. at H. H. C. Marine Dock. $600,000. Plans deposit $20. J. C. Carriere, c/o owner, engr. CD 5/17.

Ont., Sault St. Marie—PIER—BA 6/13—Dpt. Transport, Ottawa, Ont., pier repairs and alterations to pier $100,000. Plans deposit $25.

▲ **NEWFOUNDLAND—BA 6/14—Dpt. of P. Wks.**, Parliament Bldgs., St. John's,

Bishop's Falls—600 ft. bridge connecting Botwood and Norris Arm section of Trans-Canada Hp. over Exploits River near Bishop's Falls. $1,000,000.

BIDS ASKED—BUILDINGS

Ont., Petawawa—HEATING PLANT—BA 6/7—Defence Constr. Ltd., Ottawa, central heating plant exten., Army Station, $200,000. Plans deposit $100. CD 12/15.

Ont., Ottawa—CHEMISTRY, etc.—BA 6/8—Dpt. P. Wks., Hunter Bldg., chemistry, radio-activeous and administration bldg. for Dpt. Mines & Technical Survey. $600,000. Plans deposit $500. E. A. Gardner, c/o owner, archt. CD 2/9/53.

SOON LETS CONTRACT—BUILDINGS

Ont., Kitchener—FACTORY EXPANSION—Dominion Rubber Co. Ltd., 550 Papinau Ave., Montreal, Que., soon lets contract 1 story, 100x220 ft., factory expansion on Strange St., $150,000. Prack & Prack, 310 Main St. E., Hamilton, archts. CD 1/11.

BUILDINGS

LOW BIDS AND CONTRACTS

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

B. C.—**Ben Giner Constr. Co. Ltd.**, Prince George, B. C., LB, $417,892, reconstr. 8.73 mi Sorrenton Bolmoral Sect., Trans-Canada Hy Proj 612, Bids May 17;

B. C.—**Storms Contracting (Pacific) Ltd.**, 342 W Pender St., Vancouver, B. C. LB, $228,897, reconstr. 1.94 mi. Three Valley Lake eastward section of Trans-Canada Hy. Proj. 559.

▲ **Ontario Hydro-Electric Power Comn.**, 620 University Ave., Toronto, Ont., Own Forces, $3,960,000. first stage of transformer buildings for St. Lawrence Seaway power project, Cornwall, ONTARIO. CD 3/4. Bids Apr. 5.

Schwenger Constr. Ltd., 1255 Beach Rd., Hamilton, Ont., CA $441,331, sewage treatment plant, ARVA, ONT. London Twp., Township Offices, Arva, Ont. R. C. Dunn, c/o owner, twp. engr. Awarded May 16. CD 4/20.

Robinson Contg. Co. (Hamilton) Ltd., Parkdale Ave. N., Hamilton, Ont, CA $332,992, sewers in Ottawa St. HAMILTON, ONT. City, City Hall, Hamilton, Ont. W. L. McFaul, Hamilton, Ont., city engr. Awarded May 16.

BUILDINGS

LOW BIDS AND CONTRACTS

Hill-Clark-Francis Ltd., Whitewood Ave., New Liskeard, Ont., CA, $662,433, DORMITORY BLOCK, Indian Residential School on James Bay, MOOSE FACTORY, ONT. Dpt. Citizenship & Immigration, Woods Bldg., Ottawa, Ont. Awarded May 16. CD 4/20, under LB.

▲ **Thomas Fuller Constr. Co. Ltd.**, 199 Richmond St., Ottawa, Ont., CA, $1,393,567, Hygiene LABORATORY at Tunney's Park, OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. CD 2/14.

Sadlers Realty, Charlotte and Rideau Sts., Ottawa, Ont., CA, $650,000, 94-suite APARTMENT, Cartier and MacLaren Sts., OTTAWA, ONT. L. Molat, 181 Rideau St., Ottawa, Ont. Mayerovitch & Bernstein, 1500 St. Catherine St. W., Montreal, Que., archts.

▲ **Pigott Constr Co. Ltd.**, 1250 Bay St., Toronto, Ont., CA, $3,204,600, superstructure 7 floors 3 wings, 171,000 sq. ft, Ontario CANCER INSTITUTE, TORONTO, ONT. Ontario Cancer Institute, 45 St. George St., Toronto, Ont. Bids May 5, awarded May 17. CD 4/12.

Dell Construction Co. Ltd., 2461 Bloor St. W., Toronto, Ont., LB, $779,881, 2 story, bsmnt., 50x200 ft., steel frame, concrete municipal OFFICE, 2001 Eglinton Ave. E., TORONTO, ONT. Scarborough Twp., 2001 Eglinton Ave. E., Toronto, Ont. Wallace, Carruthers & Assocs. Ltd., 35 Isabella St., Toronto, Ont., engrs. CD 2/3/54.

▲ **Credit Immobilier, Inc.**, 33 Craig St. E., Montreal, Que., Owner Builds, $40,000,000, 4,000 unit HOUSING DEVELOPMENT, cottages, bungalows, duplexes and apartments, Sherbrooke St. E. ond Notre Dame St. E., secton of MONTREAL, QUE. Central Mortgage & Housing Corp., Ottawa, Ont., archt.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **ALASKA**—Alaska Road Comn., Dpt. Interior, Juneau, **Green Constr. Co.**, 321 Locust St., Des Moines, Iowa. LB $1,189,146, est. $1,276,026. surfacing, paving Sect. E-1 of Richardson Hy., Big Timber to Paxson, Bids May 17. CD 4/22.

† **Wyatt & Kipper Engineers, Inc.**, 3214 16 Ave., S.W. Seattle, Wash. CA $79,800. furnish, install water tube boiler, stoker and auxiliary equip. at University of Alaska, Proj. 50-A-147, COLLEGE, ALASKA. Alaska P. Wks., Dpt. Interior, P. O. Box 1181, Juneau, Alaska. Bids May 4. CD 4/22.

Proposed Projects

WATER SUPPLY

Ga., East Point—City, City Hall, fresh water mains $134,000; overhead pressure tank, $196,000; new raw water mains, $552,000; filter plant, $618,000. CD 9/9.

Ind., Peru—City, City Hall, ww imprvs. $250,000 or more. Pfeifer & Schultz Engr. Co., Wesley Temple Bldg., Minneapolis, Minn., consult. engr.

Minn., Rockford—Village, A. Lieder, clk., voted $137,651 bonds Apr. 25, WW sys. R. J. Ellison, 2066 Bayard Ave., St. Paul, consult. engr.

† **N. J., Duttonville**—U. S. Eng., 111 E. 16 St., New York 3, N. Y., plans by Cowell-Robinson, 25 W. 43 St., New York 36, N. Y., Low gap filter, FY55, at AC & W Site, $100,000.

Tex., Houston—Harris County Fresh Water Supply Dist. 8, Court House, voted bonds, water sys. imprvs. $100,000. CD 6/2/52.

Tex., Pasadena—City, water lines, $450,000; water storage, $100,000. CD 6/11.

Wyo., Lander—City, City Hall, voted $500,000 bonds imprv. municipal water sys., incl. mountain storage reservoir, filtration gallery, 18-in. transmission line from mountain reservoir to town; 1 m.g. storage reservoir, distr. sys. imprvs. CD 5/4.

Wyo., Lyman—City, City Hall, voted $115,000 bonds city water system imprvs.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. East, 30 m.g. water reservoir on Lawrence Ave. and Caledonia Rd., $1,800,000; 3 pumping stations, $400,000. James F. MacLaren Assocs., 705 Yonge St., consult. engrs. CD 2/2/50.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St., E., constr. St. Clair Reservoir extension, $1,650,000. Gore & Storrie Ltd., 1130 Bay St., consult. engrs. L. B. Allen, c/o owner, comr. works. CD 8/16/44.

SEWERS, WASTE DISPOSAL

Ariz., Glendale—Town, Town Hall, expanding sewage treatment plant, $73,000. Headman, Ferguson & Carollo, 3308 N. 3 St., Phoenix, consult. engrs.

▲ **Calif., Ontario and Upland**—Cities of Ontario and Upland, City Halls, sewage disposal system for both cities, $1,300,000. James M. Montgomery, 15 N. Oakland Ave., Pasadena, consult. engr. CD 11/5.

Calif., Thermal—City, City Hall, voted $150,000 bonds, sewage disposal system.

Colo., Fountain—Town, City Hall, sewerage sys., $143,500, Wilson & Co., 20 E. Ninth Ave., Denver, consult. engrs.

▲ **Ill., Chicago**—City, City Hall, auxiliary outlet sewer for Northwest Expressway from Fueton St. to Kinzie St. $1,250,000. CD 1/2/53.

Mass., Boston—Commonwealth of Mass., Metropolitan Dist. Comn., Sewer Div., 20 Somerset St., Boston, emergency repairs to North Metropolitan Sewerage System, Second St., Chelsea, $100,000. CD 7/14.

▲ **Mich., Carrollton**—Carrollton Twp., sewerage sys., incl. sewage disposal, 2½ mi. force mains, booster stations, pumping station, 18 mi. sanitary sewers. $1,000,000. The Francis Eng. Co., 301 Eddy Bldg., Saginaw, consult. engr. CD 6/4.

Minn., Elmore—Village, M. Nelson, clk., sanitary sewerage sys., sewage treatment plant. $125,000. Banister Eng. Co., 1549 University Ave., St. Paul, consult. engr.

▲ **N. Y., Farmingdale**—Town Bd., Oyster Bay, 500-ton daily capacity incinerator, Round Swamp Rd. $1,600,000.

Tex., Houston—Horseshoe Lake Addition, c/o Paul Lewis & Assocs., 905 Commerce St., storm sewers, $75,000; sanitary sewers, $80,000, 319-acre tract near Westfield.

Tex., Houston—Dan McCrary & Assocs., Rusk Bldg., sanitary sewers, $80,000; storm sewers, $75,000; Woodshire's Third Sec.

Tex., Pasadena—City, sanitary sewer lines, $500,000; sewage disposal plant, $200,000. CD 6/11.

Tex., San Antonio—Gaskin Brothers, 833 Bandera Rd., sanitary sewers, $90,000; storm sewers, $85,000, Hillcrest No. 3 Sect.

▲ **Utah, Farmington**—North Davis Co. Sewer Dist., Ray J. Dawson, pres., Layton, voted bonds May 3, sewer proj., main outfall and treatment plant, North Davis Co. incl. nine cities. $2,900,000.

BRIDGES

▲ **Ga., Atlanta**—City, City Hall, constr. Moreland Ave. Underpass and accompanying necessary widening of streets, etc. $1,500,000-$2,000,000.

Ind., Kokomo—Howard Co., Court House, bridge over Wildcat at Union St. $200,000 or more.

STREETS AND ROADS

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Oakland Co.—location on US-16 from Farmington to Kensington Lake, $6,500,000, CD 4/7/54.

c. conc. 5.4 mi. Pontiac north to Lake Orion on M-24, $1,400,000.

c. conc. Perry St. (US-24), Pontiac, $1,500,000.

b. conc. on parts of US-10, M-58 and M-59, Auburn Heights, $600,000, Carlos A. Weber, ch. engr.

Neb., Hastings—City, street surf. $300,000.

▲ **Tex., Pasadena**—City, concrete paved streets. $1,250,000.

Tex., San Antonio—Gaskin Brothers, 833 Bandera Rd., constr., asph. paving new streets, concrete curb and gutters, Hillcrest No. 3 Sect. $100,000.

EARTHWORK, WATERWAYS

▲ **California**—Sonoma County Flood Control & Water Conservation Distr., 505 Rosenberg Bldg., Santa Rosa, voted bonds, dam project and pipe line for carrying water to Santa Rosa, Seabastopol, Petumiuma, etc., area in Coyote Valley, Sonoma Co., $14,150,000. CD 4/15/54.

Calif., Richmond—Richmond Rod & Gun Club, c/o G. S. Tandy, 554 Caventry Rd., Berkeley, yacht harbor, Grant, $200,000.

AIRPORTS

† **Fla., Eglin Air Force Base**—HOUSING—U. S. Eng., 2301 Grant St., Mobile, Ala., plans by Young, Look

(Continued on page 143)

GEO. M. BREWSTER & SONS, INC. ADDS 4 NEW LORAIN 85's

THE SEVENTY-SEVENTH LORAIN—to be purchased through the years by George M. Brewster & Sons, Inc., Bogota, N. J., is the new Lorain-85 shown above. It's one of four new "85's" just added to the fleet of this well-known contractor, two of which were immediately assigned to the New York Thruway job. Brewster's contract calls for 2½ million yards of grading on a 4.7 mile section near Nyack. The Lorain-85 is digging a mixture of clay and rock with a 2½-yd. dipper and a 26-ft. boom. Brewster's repeated confidence in Lorains tells all that can be said about profit-making performance.

Let your Thew-Lorain Distributor tell you the complete story about the new Lorain-85 . . . or let him fit your job with one of the many crawler or rubber-tire types in the complete Lorain line. Bid your next job on new Lorain performance!

In the new Lorain-85's, many new features go to work for Brewster . . . these include:

- FULL AIR CONTROLS • metered air operation of crowd and retract • power boom lowering and derricking • crawler travel • dipper trip • crowd brake • steering • tread lock.
- GREATER OPERATING RANGES • 26 ft. shovel boom • 27 ft. hoe boom.
- GREATER CAPACITY • 45 tons lifting capacity.
- THIRD DRUM • power load lowering • backing down the load.
- WIDER CRAWLER • with 2 speeds in both directions.
- REMOVABLE COUNTERWEIGHT.
- TORQUE CONVERTER available.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

The entire shell of the bucket on this 50-cu. yd. power shovel is fabricated from ¾" and 6½" "T-1" Steel Plate. Liner plates are made of ½" "T-1" Steel. "T-1" Steel Plate only 6½" thick has replaced large castings a foot thick in the lip of the bucket. Lighter weight construction with "T-1" Steel made it possible to increase the cubic capacity of the bucket by ten yards.

How USS "T-1" STEEL in big machines

cuts weight, cuts cost, increases service life

Hanna Coal Company just can't afford to have this giant 50-cu. yd. shovel break down. This machine can move 2,280,000 tons of material a month, and it must operate continuously—24 hours a day, 7 days a week—to pay off.

Strong, weldable "T-1" Steel has improved the performance of this incredibly rugged machine, and it also has cut cost and weight. It enables the designers to use *fabricated* parts in place of larger, heavier, more expensive castings. And these lower-cost fabricated parts actually *last longer* than castings. As a result, Hanna Coal Company has standardized on "T-1" Steel for the vital parts of much of its heaviest-duty equipment.

Write for complete information on new USS "T-1" Steel. It has application in pressure vessels, rotating machinery, structural steel towers, steel mill equipment, big trucks, mine cars, and elsewhere.

WHAT'S "T-1" GOT?

AT HIGH TEMPERATURES. "T-1" has good creep rupture strength up to 900° F. and is being used with great success in heavy-duty, high temperature applications.

AT LOW TEMPERATURES. "T-1" is amazingly tough at temperatures far below zero . . . has withstood impacts of 2,000,000 ft. lbs. at 38 degrees below zero.

IN FABRICATION. "T-1" can be welded or flame cut without pre- or post-heating . . . and the welds develop the full 90,000 psi yield strength.

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UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS

5-475

(Continued from page 140)

& Morrison, Brent Annex, Pensacola, air force family housing, Auxiliary Field No. 9.

▲ **N. Y., Idlewild**—HANGAR—Port of New York Auth., 111 8th Ave., New York, Zone 11, cable-suspended concrete Hangar No. 12 at Trans-World Airlines Maintenance Base, International Airport. $10,000,000. CD 2/25.

▲† **Tex., Conroe**—RUNWAYS, etc.,—U. S. Govt., 8th Naval Dist., New Orleans, La., lengthening of runways for jet planes, $750,000; utilities, water, sewer, gas, paving, $200,000; various type housing, $375,000.

LATIN AMERICA

▲ **Argentina, Buenos Aires**—PLANT—Monsanto Argentina SAIC, c/o Stanley D. Allchin, pres., Buenos Aires, and Marshaol E. Young, vice pres., and genl. mgr. Overseas Div., Monsanto Chemical Co., 1700 S. 2nd St., St. Louis 4, Mo., constr. and equipping of plant for mfg. of polystyrene, near here. $1,000,000.

Mexico, Culiacan—AIRPORT—Sria de Comunicaciones y Obras Publicas, Mexico City, airport with financial cooperation of state govt. $720,000.

▲ **Mexico, Mexico City**—DWELLINGS—Mexican Social Insurance Institute, Mexico City, plans 4,000 dwellings. $4,000,000.

▲ **Mexico, Monterrey**—HOTEL—Hotel Encira, Monterrey, plans by Don Arturo Pani, Mexico City, converting Encira Hotel into one of the finest hotels in Mexico. $1,000,000.

San Salvador—P. Wks. Procurement Office, El Salvador, has published a circular specifying information required from contractors who wish to bid on the Littoral Hy. Bids will be taken from a selected list of bids.

PUBLIC BUILDINGS

Ala., Mountain Brook—HIGH SCHOOL—City, City Hall, Junior High School $375,000.

▲ **Calif., Bakersfield**—CIVIC CENTER—Kern Co. Bd. Supervs. Court House, plans by Ernest L. McCoy, 7811 H St., civic center, incl. 7 story bldg. unit to house courts and county administrative departments $3,988,000. CD 5/23/52.

Calif., Del Paso Heights—SCHOOL—Grant Union High School Dist., 1400 Grand Ave., plans by Starks & Jozens, Native Sons Bldg., Sacramento, Norte Del Rio Senior High School, $497,270. CD 12/27.

▲† **Calif., Long Beach**—HOSPITAL—Veterans Admin. Munitions Bldg., Wash. D. C., plans by Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles, Zone 36, Veterans Administration Hospital addn., new 3 story, concrete wing with 561-bed and incl. facilities for paraplegics, $7,000,000. Murray Erick Assocs., 5657 Wilshire Blvd., Los Angeles, Zone 36, structural engrs. CD 10/1.

Calif., Menlo Park—GARAGE—City, City Hall 23-car 3 story garage between University Dr. and Doyle St. $200,000.

Calif., Pinedale—SCHOOL—Pinedale Elementary School Dist., P. O. Box 442, plans by Swartz & Hyberg, Roswell Bldg., Fresno, elementary school. $630,000.

▲ **Calif., Riverside**—RESIDENCE HALL—University of California, Riverside, plans by Allison & Rible, 625 S. Westmoreland Ave., Los Angeles, women's residence hall, $2,000,000. CD 4/21/52.

Calif., Sacramento—SCHOOL—Arcade Elementary School Dist., Route 7, Box 3685, Thomas A. Edison Elementary School, $451,471.

▲ **Calif., San Jose**—JAIL, etc.—Santa Ana Co., Court House, plans by F. C. Treseder, 408 Bella Vista Ave., Los Gatos, county jail and sheriffs office, criminal court. $1,000,000. CD 4/27/44.

▲† **Colo., Camp Carson**—HOUSING—U. S. Eng., 1709 Jackson St., Omaha, Neb., plans by Miles Lantz & Co., engrs.-archts., 933 Sherman St., Denver, 500 unit housing for officers and enlisted men. $5,000,000.

Ga., Newnan—SCHOOLS—City, City Hall, plans by Bothwell & Nash, 208 Roswell St., Marietta, school imprvs. $750,000. CD 12/23/52.

Idaho, Grangeville—SCHOOL—School District 241, Grangeville, voted bonds, high school $350,000. Whitehouse & Price, Hutton Bldg., Spokane, Wash., archts. CD 11/18.

Ill., Park Forest—SCHOOL—School District No. 227, Westwood Dr. and Sauk Trail, plans by Loebl, Schlossman & Bennett, 430 Michigan Ave., Chicago, Zone 11, 1 story high school addn. $450,000.

▲ **Ill., Skokie**—SCHOOL—School District 219, c/o Niles Twp. High School No. 1, Skokie, plans by Holabird, Root & Burgee, 180 N. Wabash St., Chicago, Zone 1, Niles Township High School No. II, Oakton and Grosse Point Rd. $5,000,000. Thos J. Higgins, 228 N. La Salle St., Chicago, Zone 1, consult. archt.

Ill., Waterloo—SCHOOL addns.—Community Unit School Dist. 5, Bd. Educ., Waterloo, plans by Wm. B. Ittner, Inc., archt.-engr., 408 Bd. Education Bldg., 911 Locust St., St. Louis 1, Mo., 1 and 2 story Junior-Senior High School addn. and 2 elementary schools addns. $959,000.

Ind., Lebanon—SCHOOL—Bd. Educ., Delue Akerman, pres., plans by McGuire & Shook, Fletcher Trust Bldg., Indianapolis, Harney Grade School and Lebanon High School. CD 4/27/48.

Iowa, Ackley—SCHOOL—Bd. Educ., Ackley, voted bonds. school addn. $390,000.

Kan., Kansas City—SCHOOL—Bd. Educ., Library Bldg., plans by R. E. Meyn, 602 Minnesota St., Kansas City, Kan., Bryant School, 17 and Webster Sts. $400,000. CD 10/28/53.

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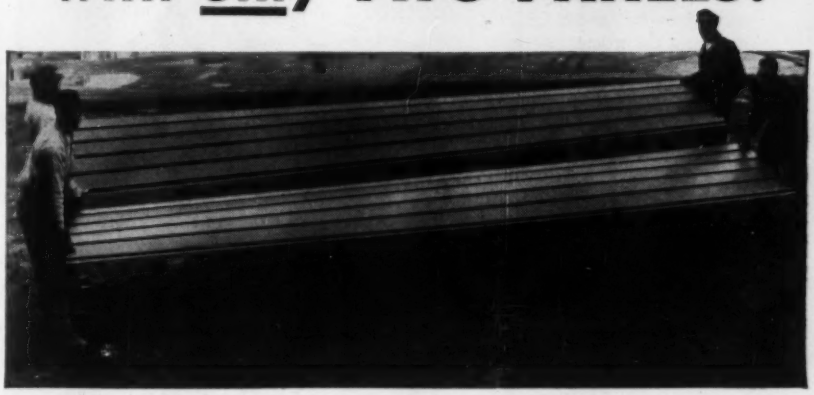

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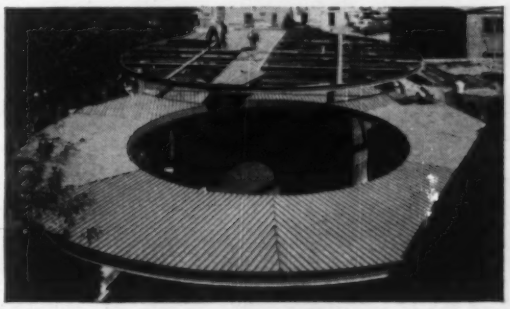

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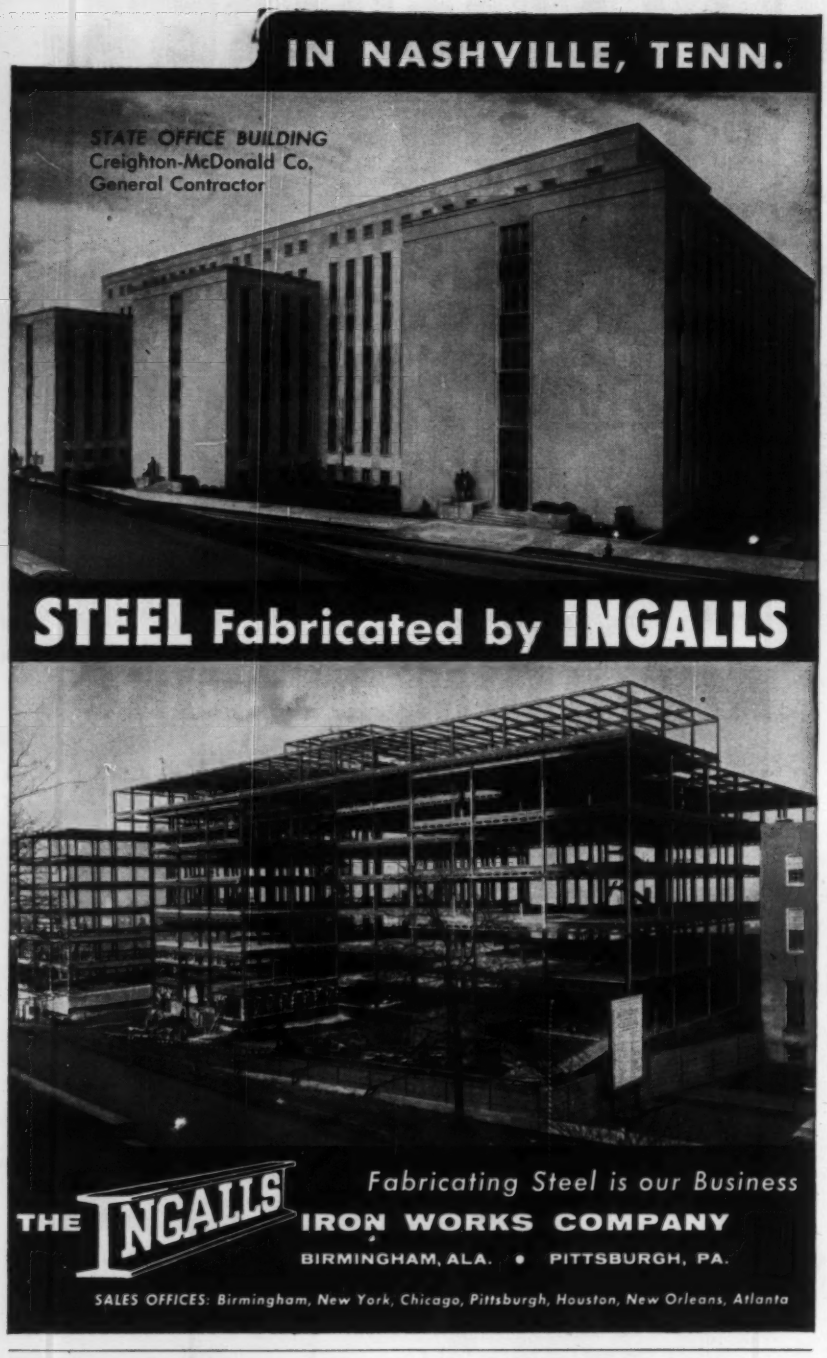
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▲ **Ky., Lexington**—APARTMENT—University of Kentucky S. Lime St., plans by Edward D. Dart, 201 N. Wells St., Chicago 6, Ill., and Thos. P. Edwards, assoc. archt., 148 Barr St., 178 apartment units, $1,500,000. CD 4/11.

▲ **Mass., Worcester**—HOSPITAL—City, Trustees City Hospital, 71 Jacques Ave., plans by Roger Garland & Assoc., 791 Main St., hospital addn., 71 Jacques Ave., $1,750,000. CD 9/7.

Mich., Charlotte—SCHOOL—City, Bd. Educ., $750,000 bond election June 27, high school addn.

▲ **Minn., Crookston**—SCHOOL—Bd. Educ., I. I. Swanson, clk., $1,875,000 bond election May 17, high school addn., $1,455,000, McKinley Grade School, $350,000, Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts.

▲ **Minn., New Brighton**—SCHOOLS—Bd. Educ., Mounds View Independent School Dist. No. 38, Ramsey Co., D. D. Wendt, clk., plans by M & G Buetow, 1931 University Ave., St. Paul, grade school at Ramsey County Rd. 1 and Quincy Ave., $600,000; grade school east of Lake Johanna, $400,000. CD 4/18.

▲ **Mont., Great Falls**—HOSPITAL—Cascade Co., Court House, county general hospital, $1,000,000. CD 9/13/45.

▲ **N. H., Concord**—SCHOOL—Concord Union High School Dist., c/o Supt. Schools, Parker School Bldg., plans by Alonzo J. Harriman, Inc., 292 Court St. Auburn, Me., Junior High School, South and Cypress Sts., $1,400,000.

▲ **Tex., Denver City**—HIGH SCHOOL—Sligo Independent School Dist., J. W. Jones, supt., Denver City, 1 story, brick, tile high school. $1,000,000.

Tex., Humble—SCHOOL—Humble Independent School Dist., Humble, defeated bonds, school $600,000. CD 4/8.

Tex., Pasadena—AUDITORIUM—City, auditorium, $750,000. CD 12/3.

▲ **Tex., San Antonio**—SCHOOLS—Edgewood Independent School Dist., 525 Cupples Rd., voted bonds May 7, No. 1 elementary school, $450,000; No. 2 elementary school, $350,000; Junior High School, $700,000. Paul G. Silber & Co., 1919½ Cincinnati Ave., archts. CD 4/6.

▲ **Tex., Texas City**—HIGH SCHOOL—Texas City Independent School Dist., Texas City, plans by Wyatt C. Hedrick, 5201 Fannin St., Houston, high school. $2,000,000.

▲ **Wash., Tacoma**—SCHOOLS—School District 10, 601 S. 10 St., voted bonds, West Side High School $2,590,000, CD 3/23; South End Junior High School $800,000, R. B. Price & M. W. Perrow, 2907 A St. archts.; vocational school addn. $635,000. CD 3/16; Junior High School in Browns Point Area $825,000.

▲ **Wash., Vancouver**—SCHOOL—Vancouver School District, Vancouver, plans by McCoy & Bradbury, 7007 Hy. 99 Vancouver, McLoughlin Junior High School, $1,200,000. CD 9/18/52.

Wyo., Buffalo—SCHOOLS—Johnson County High School District, Buffalo, $550,000 bond election June 21, high school addn.

COMMERCIAL BUILDINGS

▲ **Calif., Fresno**—MEDICAL CENTER—Spalding, Wathen & Bonadelle, c/o Howard Schroeder, archt., Mason Bldg., medical center, incl. 18 brick units, parking area. $500,000.

▲ **Calif., Fresno**—SHOPPING CENTER—Spalding, Wathen & Bonadelle, c/o Howard Schroeder, archt., Mason Bldg., shopping center. $1,000,000.

▲ **Calif., San Francisco**—HEADQUARTERS OFFICE—Crown Zellerbach Corp., 343 Sansom St., plans by Hertzka & Knowles, 85 Post St. and Skidmore, Owings & Merrill, 1 Montgomery St., 22 story, steel headquarters office bldg. with an underground two level garage $3,500,000. H. J. Brunnier Co., Sharon Bldg., consult. engr.

▲ **Calif., San Jose**—HOMES—Stone & Schulte Realtors, 1745 W. San Carlos St., 350-home subdivision, Lynn-Haven Tract, $7,000,000; 148-home subdivision, Foxworth and Willow Glen Area, $2,960,000 86-home subdivision Shadow-Woods Tract, $1,462,000 44 home subdivision Cherrydale Tract, $1,056,000 39-home subdivision Brookside Tract, $419,000.

Calif., San Francisco—STORE—Safeway Stores, Inc. c/o Bramwell Constr. Co. 656 31 St., Oakland, store, Chestnut and Taylor Sts. $500,000.

▲ **Calif., San Mateo**—HOMES—Richard Grant, Box 971, 1,000-home subdivision, Westshore No. 1, $14,000,000.

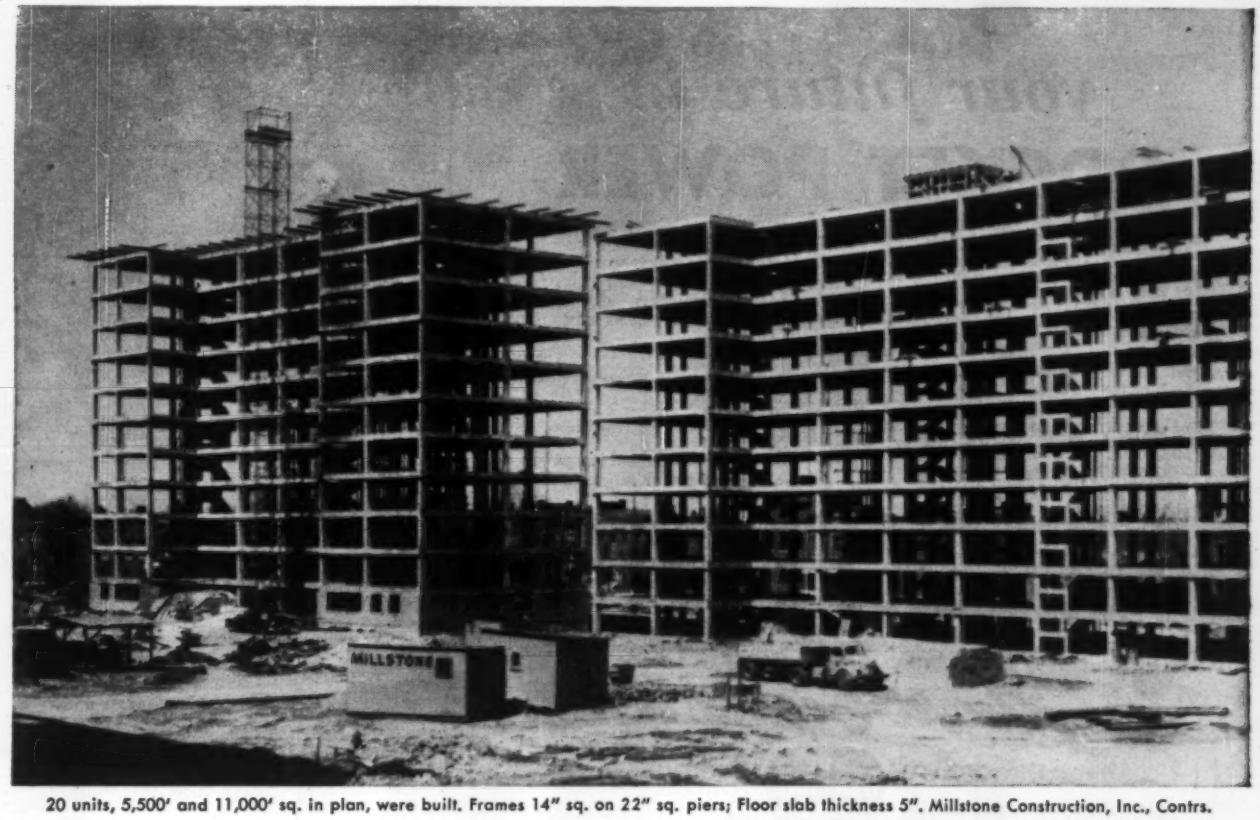
▲ **Calif., Torrance**—SHOPPING CENTER—Store Properties Inc., c/o Pereira & Luckman, archts., 9220 Sunset Blvd., Los Angeles, and Harold Johnson, archt., 606 S. Hill St., Los Angeles, 600,000 sq. ft. shopping center, Pacific Coast Hy. and Crenshaw Blvd. $4,000,000.

▲ **Colo., Pueblo**—SHOPPING CENTER—Pueblo Shopping, Inc., c/o T. H. Buell & Co., consult. engrs-archts., 730 14 St., Denver, shopping center, parking area, $4,000,000.

▲ **Minn., Lexington (P. O. St. Paul)**—SHOPPING CENTER—H. Shanedling Sons Corp., 2025 Nicollet Ave., Minneapolis plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, Lexington Pike Shopping Center, incl. 28 units, 200,000 sq. ft. shopping center area, Anoka Co. on tract at Hy. 8 and Woodland Rd., $2,000,000. CD 2/24.

▲ **Mo., Clayton (St. Louis 5 P.O.)**—BANK and MEDICAL SECTION—Syndicate, c/o Delk Investment Corp., Missouri Pacific Bldg., 13 and Olive St., St. Louis, Zone 3, 3 story, bsmnt., bank and medical section Brentwood Blvd. and Clayton Rd. $1,000,000.

(Continued on page 146)



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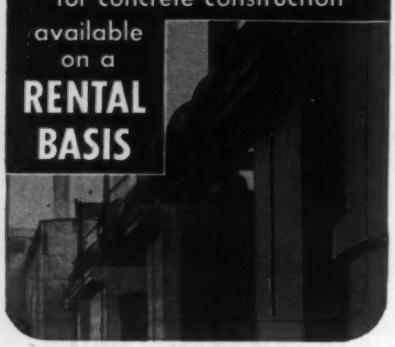

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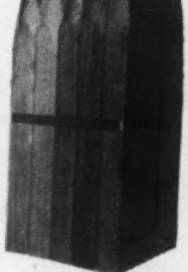

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–36"	24.00	22.50
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–18"	7.50	6.50
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(Continued from page 144)

▲ **Neb., Lincoln**—HOME OFFICE—Bankers Life Insurance Co., 1345 "N" St., plans by Unthank & Unthank, 527 Sharp Bldg., Lincoln, and Shreve, Lamb & Harmon, 11 E. 44 St., New York, N. Y., home office bldg. $1,300,000. J. P. Anderson & Co., 2655 St. Marys Ave., Omaha, mechanical engrs. CD 11/3.

▲ **N. J., Bloomfield**—CHURCH, etc.—Brookdale Baptist Church, Broad St. and Mountain Ave., plans by Krahmer, Staab & Immen, 27 Washington St., Newark, church, rectory and school. $1,000,000.

N. J., South Orange—SYNAGOGUE—Congregation Oheb Shalom, c/o Kruger & Fava, archts., 11 Hill St., Newark, synagogue, social hall, etc., 180 Scotland Rd. $750,000.

N. J., South Orange—SCHOOL—Marylawn of the Oranges School, 405 Scotland Rd., plans by William Mitchell, 59 Second St., high school. $500,000.

▲ **N. J., West Orange**—HOSPITAL, etc.—St. Mary's Hospital, 135 S. Center St., Orange, 200-bed hospital, 100 nurses home, convent for 25 nuns, laundry and heating bldg., 10-acre tract, Prospect Ave. and Eagle Rock Ave. $5,000,000.

N. Y., Ithaca—APARTMENTS—Cornell University, Ithaca, plans by Von Storch, Evans & Burkavage, Waverly, Pa., 8 apartments for married students and instructors. $800,000.

N. Y., New York—POST OFFICE, etc.—Alton Estates, Inc., 101 Park Ave., New York, Zone 17, plans by H. I. Feldman, 415 Lexington Ave., New York, Zone 17, 2 story post office and office, 1980-98 Broadway, $700,000.

▲ **N. Y., New York**—APARTMENT—Gross Bros., 380 Madison Ave., Zone 17, plans by Paul Resnick, 654 Madison Ave., Zone 21, and Schulman & Soloway, 100-15 Queens Blvd., Forest Hills, apartment, 57 St. between Park and Lexington Aves. $1,000,000.

N. Y., New York—APARTMENT—Hugh K. McGovern, c/o H. I. Feldman, archt., 415 Lexington Ave., Zone 17, 12 story apartment, 404-14 E. 66 St. and 413-15 E. 65 St. $750,000.

▲ **N. Y., New York**—OFFICE, etc.—National Council of Churches of Christ in U. S. A., 297 4th Ave., plans by Collens, Willis & Beckonert, 20 Newbury St., Boston, Mass., 17 story lime-faced office with sub-bsmnt. garage, Riverside Dr., 119 and 120 Sts. $14,000,000.

N. Y., Rego Park—APARTMENT—Sato Realty Corp., c/o H. Herbert Lilien, archt., 201 W. 72 St., New York, Zone 23, 6 story apartment, Booth St. between 67 Dr. and 67 Rd. $550,000.

N. D., Jamestown—DORMITORY—Jamestown College, Jamestown, plans by Lang & Raugland, Wesley Temple Bldg., Minneapolis, Minn., girls dormitory, $800,000.

O., Delaware—COLLEGE BLDG.—Ohio Wesleyan University, Delaware, Kathryn Sisson Phillips Hall of Religion and Education. $500,000.

▲ **O., Shelby**—HOSPITAL—Shelby Memorial Hospital, Shelby, plans by Conrad & Simpson, Hanna Bldg., Cleveland, 2 story, brick, concrete, steel hospital addn. $1,000,000. CD 3/24.

▲ **O., University Heights**—STORE—May Co., Euclid Ave. and Ontario St., Cleveland, 4 story 300,000 sq. ft. brick, granite department store, Cedar and Warrensville Center Rds., parking facilities. $5,000,000.

▲ **Ore., Eugene**—OFFICE—Continental Property Factors, Park Bldg., Portland, plans by Dougan & Heims, Portland Trust Bldg., Portland, 8 or 10 story office bldg. $2,225,000.

Ore., Portland—HOSPITAL—Portland Osteopathic Hospital 616 N. W. 18 St., plans by Scott & Payne, Builders Exchange Bldg., 50-bed hospital $500,000.

Tex., Beaumont—PROFESSIONAL—Corporation, c/o Dr. Grady Bevil, Beaumont, 3 and 4 story professional bldg. $700,000-$900,000.

Tex., Houston—STORES—Theodore Berenson & Assocs., 50 Federal St., Boston, Mass., plans by John Graham & Co., 1426 5 Ave., Seattle, Wash., Phase 4, of overall projects, interior finishings and store fronts for 25 stores in Gulfgate Shopping Center, Over $500,000. CD 2/26/53.

▲ **Wash., Renton**—HOMES—Ireland Homes, Inc., 6507½ Roosevelt Way, Seattle, 100 homes in Talbot Hills addn. $1,000,000.

▲ **Wash., Seattle** — HOSPITAL — Sound View Hospital Corp., c/o E. H. Savage, 4424 California Ave., hospital, $4,650,000. Harmon, Pray & Dietrich, Lloyd Bldg., consult. engrs. CD 6/12/51.

Wash., Spokane—MOTOR LODGE—A. H. Bowles, 330 Sprague St., 9 story motor lodge, $500,000.

▲ **Wash., Spokane** — HOUSING — Guthrie Constr. Co., N2918 Nevada St., housing development in northwest district, south of Garland and west of Oak St., $2,500,000.

▲ **Wash., Vancouver**—DEPARTMENT STORE—Lane Development Co., 602 S.W. Washington St., Portland, Ore. plans by Wolff & Zimmer, Pearson-4th Ave. Bldg., Portland, Ore., 3 story, bsmnt., rein.-con. department store. $1,000,000. J. C. Penney Co., lessee. CD 3/17.

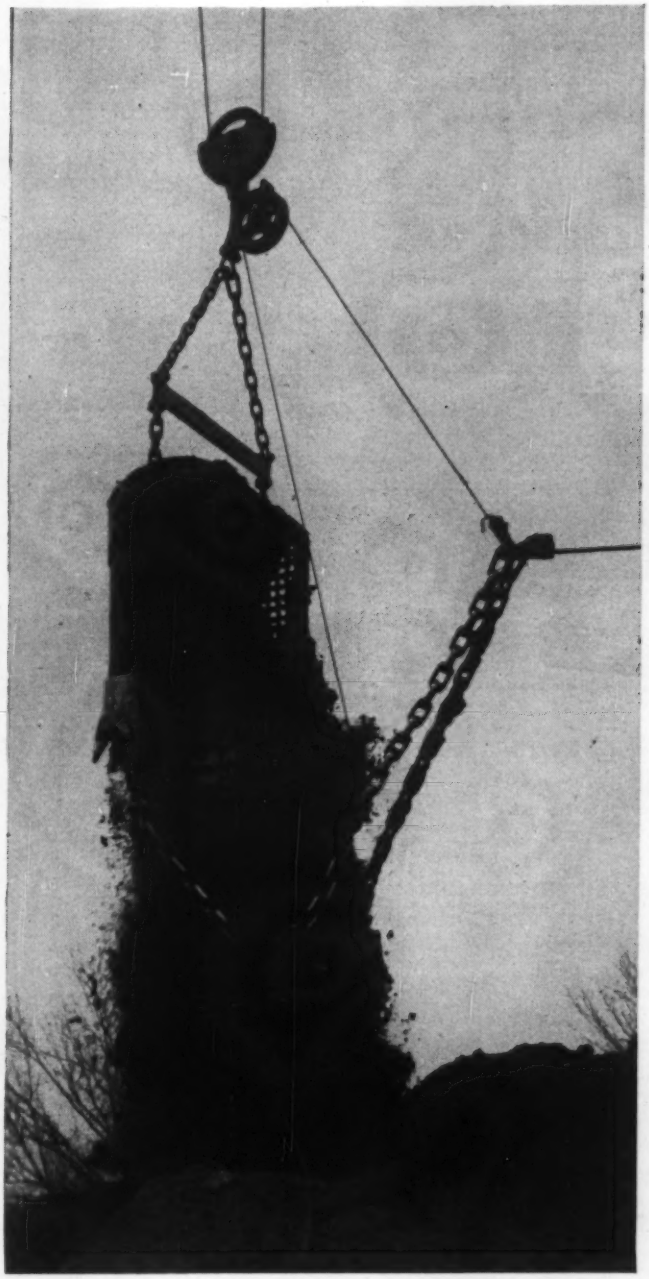
Wis., Wauwatosa—HOME—Home for Aged Lutherans, 7500 W. North Ave., plans by Grassold-Johnson & Assocs., 734 N. Jefferson St., Milwaukee, Zone 2, 3 story home addn., alterations, $900,000. 5/28/54.

Alta., Edmonton—STORES, etc.—Owner, c/o Blais & English, archts., 9642 Jasper Ave., 5 story, bsmnt., 53x150 ft. building, incl. stores and offices, $650,000.

▲ **B. C., Vancouver**—MAIN OFFICE—Imperial Bank of Canada, 586 Granville St., plans by McCarter, Nairne & Partners, 1930 Marine Bldg., 5 or 6 story main office, Dunsmuri and Granville Sts., $1,800,000. CD 12/7/45.

Ont., Toronto—APARTMENT—561 Avenue Road, Ltd., 111 Richmond St., W., plans by Page & Steele, 72 St. Clair Ave. W., 14 story, 83 suite brick, apartment, 561 Avenue Road, $670,000.

(Continued on page 150)



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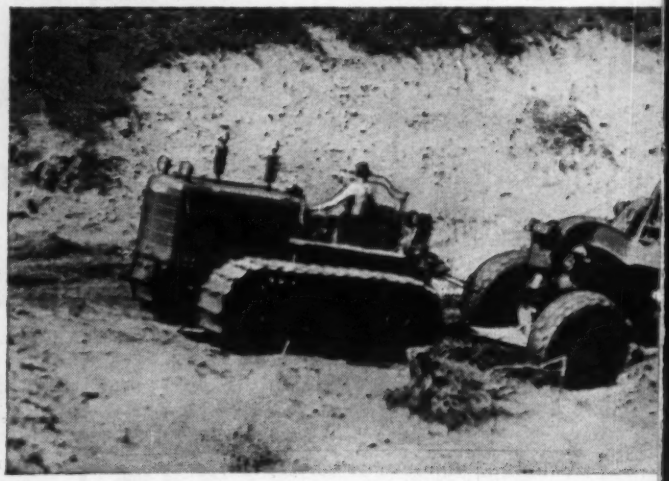
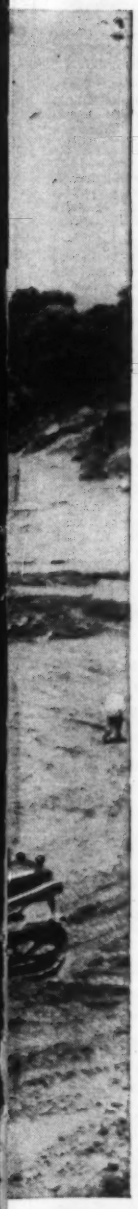
DAM FOR CORDRY LAKE, 700 feet thick at the base, is built by this fleet of three INTERNATIONAL TD-18A crawlers and scrapers and one INTERNATIONAL TD-14A with hydraulic dozer used for push-loading on inclines and in soft spots, and some other equipment.

LAKE LEAKAGE is eliminated by removing all porous soil and stone from the site of the dam base and replacing it with impervious clay fill from distances up to 1,000 feet from a nearby hill.

BUILDING UP THE DAM BASE moves along on schedule as one of three TD-18A scraper combinations brings a heaping load of clay to the construction site.





Moves 1,000,000 cubic yards to build a lake

Howard Prince, veteran Indiana contractor, has used INTERNATIONAL crawlers to build more than 100 lakes since 1935—and he has two large lakes under construction right now!

A water shortage is being remedied and a new vacation area opened by a chain of fourteen lakes being built across Brown County, Indiana, by veteran lake builder Howard Prince, head of the Prince Lake Building Company, Nineveh, Indiana.

Latest and largest in the chain is Cordry Lake, the 103rd lake to be built by Prince.

Cordry Lake, which will eventually cover more than 600 acres, is being created by building a dam 750 feet long, 120 feet high, across two small streams. In excavating unsuitable material from the dam site and borrowing leakage-proof clay from a nearby hill, the lake builders will move over 1,000,000 cubic yards of dirt.

The entire job is being handled by Prince's fleet of seven INTERNATIONAL crawlers with matched IH scrapers and blades, and some other equipment.

Howard Prince has been an INTERNATIONAL owner ever since he first started in business, and states: *"I bought my first* INTERNATIONAL *crawler in 1935 and I've been using them ever since.*

"I've been increasing my INTERNATIONAL *equipment until I now have three TD-18As with scrapers, two TD-14As with blades, a TD-9 and two TD-6s on this job.*

"On lake building projects, as well as all other types of work, they have proved both dependable and economical through the years."

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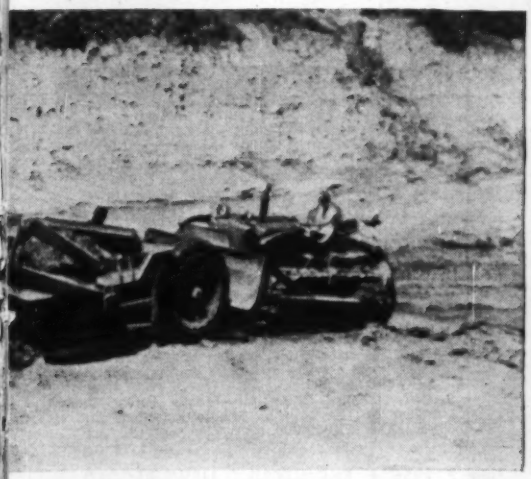
MAKES EVERY LOAD A PAYLOAD

REMEDY FOR NATURE'S OVERSIGHT. The Brown County Lake Development project is adding immeasurably to the natural beauty of that Hoosier county by building 14 lakes in an area that has all the scenic wonders except lakes.



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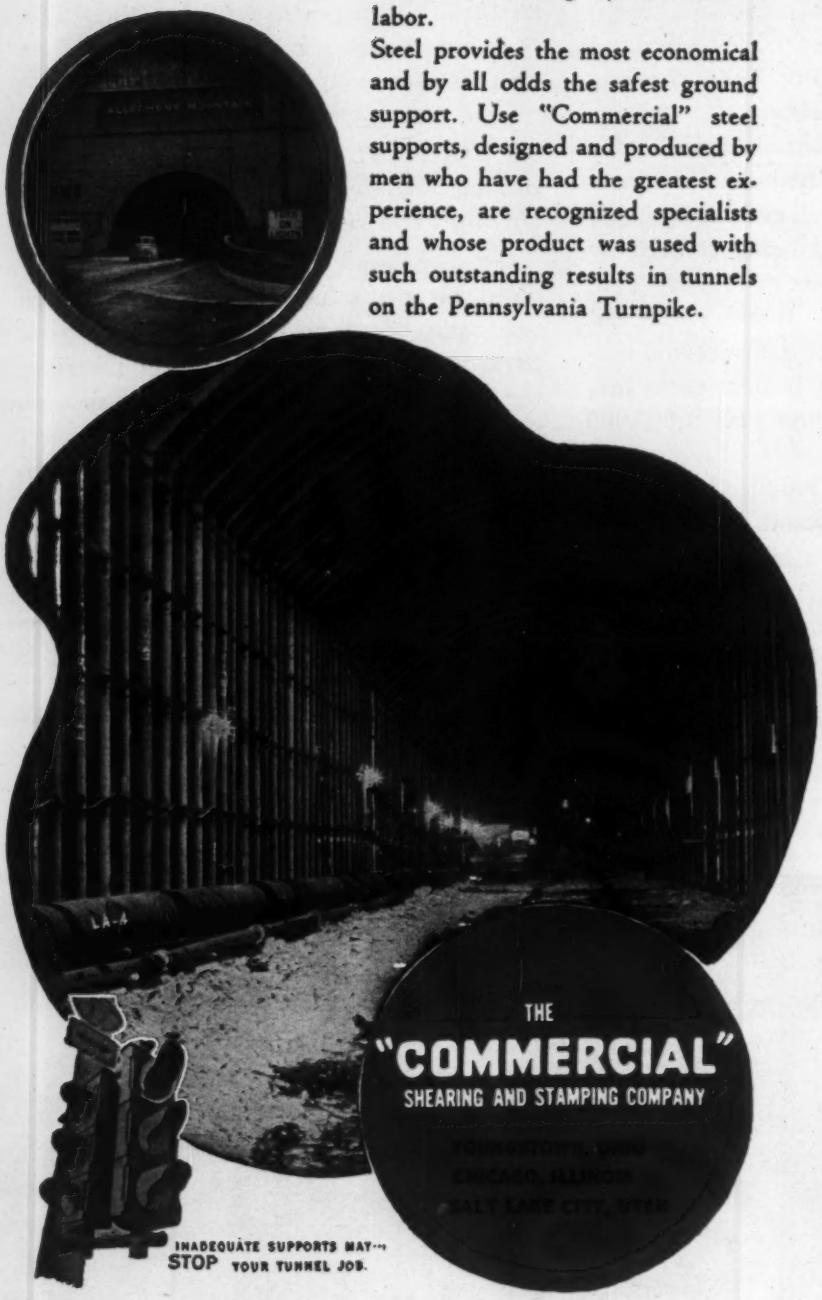
Steel provides the most economical and by all odds the safest ground support. Use "Commercial" steel supports, designed and produced by men who have had the greatest experience, are recognized specialists and whose product was used with such outstanding results in tunnels on the Pennsylvania Turnpike.



(Continued from page 146)

Que., Montreal—APARTMENT—Elite Construction Ltd., c/o Estimating Quantities, Reg'd, 8475 Decarie Blvd. plans by Thibodeau & Thibodeau, 940 Cote de Liesse Rd., 3 story, bsmnt., 110x145 ft. 42-suite, concrete, brick, stone apartment, Portland Ave. $500,000.

▲ Que., Montreal—HOUSING—Garson Homes Corp., 5165 Sherbrooke St. W., housing 300 bungalows, gas station, motel, shopping center, garden-type apartments, Beaconsfield Blvd. suburban Montreal, $3,000,000.

▲ Que., Montreal—OFFICE—Terminal Office Corp., 1637 Sherbrooke St. W., plans by Greenspoon, Friedlander & Dunne, 4151 Sherbrooke St. W., 10 story and 3 story terminal office bldg. $2,000,000. J. P. Keith & Assocs., 4935 Clanranald Ave., consult. engrs. CD 4/14.

▲ Sask., Regina—HOUSING—Graybar Holdings (Sask.) c/o Green, Blankstein, Russell & Assocs., archts., 222 Osborne St. N., Winnipeg, Man., and McCudden & Robbins, 1411 Albert St., 700-unit housing. $6,000,000.

INDUSTRIAL BUILDINGS

▲ Ala., Huntsville—INDUSTRIAL—The Norton Co., 1 New Bond St., Worcester, Mass., industrial bldg., 99-acre site on Tennessee River near Hobbs Island, $1,250,000. G. M. Jones & Sons, Huntsville, plant engrs. CD 11/23.

▲ Calif., Pittsburg — PLANT — Kaiser Gypsum Co., 1924 Broadway, Oakland, gypsum board plant and plaster mill, $5,000,000.

▲ Calif., Santa Ana—PLANT—United States Rubber Co., Rockefeller Center, New York 20, N. Y. Plans by Donald R. Warren Co., 3109 Wilshire Blvd., Los Angeles, Zone 5, foam rubber plant addn. $1,000,000.

▲ Ind., Indiana Harbor—COKE OVENS, etc.—Inland Steel Co., 38 Dearborn St., Chicago 3, Ill., 87 by-product coke ovens, coal handling facilities and storage facilities, Over $5,000,000.

▲ Mich., Rochester—PLANT—Parke Davis & Co., Joseph Campau at the river, Detroit, plant mfg. polio vaccine, $1,000,000.

▲ N. J., Princeton—PLANT—Educational Testing Service, 20 Nassau St., New York, N. Y., plans by Harrison & Abramovitz, 630 Park Ave., New York, Zone 20, N. Y., group of plant buildings on 200-acre tract, near here, $2,000,000. Clarke & Rapuano, 145 E. 32 St., New York 16, N. Y., landscape archts.

▲ O., Cleveland—PLANT—Midland Steel Products Co., 10615 Madison Ave., 40x300 ft. masonry plant steel-cleaning operation. $1,000,000.

▲ O., Marysville—PLANT—O. M. Scott & Sons Co., Marysville, chemical products plant to produce Scott's Turf Builder. $1,000,000.

▲ O., Toledo—MARINE TERMINAL, etc.—D. H. Overmyer Warehouse Co., 217 Cherry St., plans by Hahn & Hayes, 723 Adams St., 100,000 sq. ft. marine terminal and warehouse, 10,000 ft. railroad track, cranes, loading docks, etc. on Maumee River, north of Anthony Wayne Bridge. $2,000,000. CD 7/13/53.

▲ Okla., Bartlesville—LABORATORY—Phillips Petroleum Co., Phillips Research Center, Bartlesville, chemical research laboratory. $7,500,000. CD 5/3.

▲ Okla., Lindsay—PLANT—Phillips Petroleum Co., Bartlesville, casing head gasoline plant in Lindsay oil field. $1,000,000. C. W. Hubbell, c/o owner, engr.

▲ Okla., Tulsa—FREIGHT CLASSIFICATION YARD—St. Louis & San Francisco Ry. Co., L. Anderson, ch. engr., 309 N. Jefferson St., Springfield, Mo. freight classification yard. $5,500,000.

▲ Tex., Pampa—PLANT—Celanese Corp. of America, Kings Mill, doubling capacity existing plant at Kings Mill. $2,500,000. CD 5/22/52.

▲ Ont., Toronto—PLANT—Canadian Industries Ltd., P.O. Box 10, Montreal, Que., exten. paint and varnish division plant on Castlefield Ave. and Ronald Ave. $3,000,000. CD 5/24/54.

▲ Que., Montreal—PLANT—Canadian International Paper Co. Ltd., Surf Life Bldg., plans by Philip F. Goodfellow, 1117 St. Catherine St. W., 1 story, 125,000 sq. ft., steel, block, brick container plant between Sherbrooke St. E. and C.N.R. railway tracks, $1,250,000. S. L. Sachs, 5880 Cote St. Antoine Rd., consult. engr. W. Bennett, c/o owner, ch. engr. CD 3/11.

UNCLASSIFIED

▲ Miss., Pascagoula—HARBOR and PORT—Jackson Co., Pascagoula, industrial harbor and port proj. at Bayou Casotte, $2,000,000, Michael Baker, Inc., Northview Dr. at Meadowbrook Circle, Jackson, Zone 10, consult. engr.

N. Y., Portchester—MARINA—Village, Village Hall, marina at mouth of Byram River near Adee St. $600,000.

Tex., Liberty—LIGHTING, etc.—City, voted bonds modernizing street lighting sys., $150,000; extens. electric distr. sys., $126,000. CD 4/27.

▲ Ont., Hamilton—NAVAL BASIN—Hamilton Harbor Comn., Hamilton, naval basin extension of docks, Wellington St. and Ship St. docks, superhighway bridge across western section of harbor; vertical lift bridge for railway and motor traffic over Burlington Canal, grain elevator and docks in Burlington Beach Area. $10,000,000.

▲ Ont., Toronto—TERMINAL—Toronto Harbor Comn., Harbor St., terminal, on Toronto waterfront east of Yonge St. $1,000,000.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

Mass., Boston—BA 6/9—State, Metropolitan Dist. Comn., Sewer Div., 20 Somerset St., Contr. 201, Sect. 2, south Charles Relief Sewer, South Metropolitan Sewerage Dist., 4,330 ft., 689 in. x 9 ft. cast in place rein.-con., depth 20/30 ft., Brighton, $900,000. Plans deposit $25, refundable. CD 1/15/52.

▲† **Mass., Boston**—PIER—BA 6/14—Dist. P. Wks. Office, IND, 495 Summer St., Boston, replacement of Pier 11, Boston Naval Shipyard, NOY 85264, Spec. 43308. Plans deposit $80. Bids 5/10 rejected. CD 5/13, under LB.

BIDS ASKED—BUILDINGS

▲ **Vt., Rutland**—SCHOOL—BA 6/21—City School Dpt., Rutland, Junior High School, adjacent to present high school $1,000,000. Plans deposit $50. Webber & Erickson, 56½ Merchants Row, Rutland, archt. Nichols & Butterfield, 967 Farmington Ave., West Hartford, Conn., consult. archts. CD 10/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Gil Wyner Co., Inc.,** 12 Newland St., Malden, Mass. and **Grande & Sons, Inc.,** 425A Broadway, Everett, Mass. CA **$969,456** (joint venture) est. $950,000. apron strengthening and calibration hardstand, Westover Air Force Base, ENG-19-016-55-119, CHICOPEE FALLS, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 5/23, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Turner Constr. Co.,** 420 Lexington Ave., New York 17, N. Y., CA Eest. **$1,000,000.** 3 story, 60x170 ft. steel, concrete RESEARCH and DEVELOPMENT CENTER, GROTON, CONN. General Dynamics Corp., c/o Electric Boat Div., Groton, Conn. CD 3/22.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES

June 14 New Jersey June 16 New York

STREETS AND ROADS

June 7, 14, 21 Maryland June 14 New Jersey
June 16 New York

BIDS ASKED—BUILDINGS

▲ **N. Y., New York** — AUDITORIUM — Bids Asked — Rockefeller Institute of Medical Research, York Ave. and 66 St. (selected list bidders) 3 buildings to house auditorium, faculty club and executive offices on 12 acre tract on York Ave. between 66 and 67 Sts. $2,000,000. Harrison & Abramowitz, 630 Fifth Ave., Zone 20, archts. CD 10/25.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Triborough Bridge & Tunnel Auth., Admin. Bldg., Randall's Island, New York, Zone 15, **Nassau-Mascali Constr. Corp.,** 69-34 51 Ave., Woodside, N. Y. CA **$2,222,147.** Contr. CB-2 grading, drainage, utilities, paving, Linden Blvd. to Atlantic Ave. Brooklyn and Queens Boro. CD 4/18, under LB.

▲ **NEW JERSEY-PENNSYLVANIA**—Delaware River Bridge Auth., Administration Bldg., Camden ,N. J. **Kaufman Constr. Co.,** 4000 Pulaski Ave., Phila., Pa., LB **$3,394,424,** Contract P-6, road grading, drainage, separation structures, city street changes, Moyamensing Ave. to 7 St. and Randolph St. Structure, Camden Co. Bids May 12. CD 4/15.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave. Trenton, **Villa Contrg. Co. Inc.,** 233 North Ave, Westfield, N. J., CA, **$1,722,671,** widening 12.943 mi. Route 4 Parkway (Sections 1E, 2G, 4H, 5E, 6K, 7G, 8E and 9K) from U. S. Route 9 to U. S. Route 22 in Woodbridge Clark, Cranford and Union Twps., Proj. U-188 (3) Middlesex and Union Counties. Bids May 20, awarded May 23. CD 5/4.

▲ **J. Rich Steers, Inc.,** 17 Battery Pl., N. Y., N. Y. LB **4,134,560,** concrete pipe; **$3,468,000** alternate for corrugated metal pipe, Contract 12, outfall sewers, water mains, access roads appurtenances, NEW BRUNSWICK, N. J. Middlesex County Sewerage Auth., 103 Bayard St., New Brunswick, N. J. Bids May 20. CD 4/18.

▲ **Verona Contg. Co., Inc.,** 251½ Grove Ave., Verona, N. J. LB **$1,729,030,** 72-in. pipe; **$1,999,040** 78-in. pipe Contract 11, 19,000 lin. ft. rein.-con. pressure pipe, NEWS BRUNSWICK, N. J. Middlesex County Sewerage Auth., 103 Bayard St., New Brunswick, N. J. Bids May 24. CD 4/25; **Elmhurst Contg. Co., Inc., & Charles F. Vachris, Inc.,** 2024 Ditmars Ave., Brooklyn, N. Y., LB, **$1,747,447** 72-in. pipe; **$1,884,259,** 78-in. pipe. (New Brunswick, N. J.).

Baton Constr. Corp., 1717 Sansom St., Phila., Pa., LB, **$882,366,** general contract Group C, TWA Maintenance Hangar, Phila. International Airport, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. The Ballinger Co., 121 N. Broad St., engr.-archt. CD 1/13/50.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Newell & Daniels,** Cedar Swamp Rd., Brookville, N. Y. Owner Builds. **$1,300,000.** 28 HOUSES on tract at Cedar Swamp Rd. and Fruitledge Rd., BROOKVILLE, N. Y.

▲ **Suburban Manor Homes,** c/o Murray J. Landman, 2 W. First St., Mount Vernon, N. Y. Owner Builds. **$3,400,000,** 200 HOUSES on tract, Old Saw Mill River Rd., ELMSFORD, N. Y.

▲ **Stanwich Homes,** c/o Julius Fishkind, archt., 161-19 Jamaica Ave., Jamaica, N. Y. Owner Builds. **$1,250,-000.** 56 HOUSES on tract at Main St. and Milbourne Ave., FLUSHING, N. Y.

▲ **Sinclair Estate Homes,** c/o Siegel & Rapp, archts., 2 Cypress Ave., Great Neck, N. Y. Owner Builds. **$1,800,000.** 24 HOUSES on 30 acre tract on West Shore Drive, GREAT NECK, N. Y.

▲ **Joland Homes,** c/o John J. Braglia, 1601 Hempstead Turnpike, Elmont, N. Y. Owner Builds. **$1,400,000.** 75 HOUSES on tract on Washington Ave., east of Manetto Hill Rd., PLAINVIEW, N. Y.

▲ **Schoenfeldt & Casselton,** c/o State Real Estate Co., 35 Broadway, Hicksville, N. Y. Owner Builds. **$2,000,-000.** 150 HOUSES on 40 acre tract on Bethpage Rd., PLAINVIEW, N. Y..

▲ **Woodmere Park Estates,** c/o N. M. Obedin Co., 124 Jackson St., Hempstead, N. Y. Owner Builds. **$3,600,-000.** 120 HOUSES on tract at Clubhouse Rd. near Woodmere Blvd., WOODMERE, N. Y.

▲ **Lynne Oakes Estates,** c/o Andrew Rassmussen, archt., 217 Smith St., Perth Amboy, N. J., Owner Builds, **$1,000,000,** 72 HOUSES on tract on New Dover Rd., COLONIA, N. J.

▲ **Lionel Constr. Co.,** 503 Market St., Camden, N. J. Separate Contracts, **$1,500,000,** RESIDENTIAL DEVELOPMENT, PENNSAUKEN, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archts.

▲ **Margaret Reilly,** c/o Kirl Mtg. Co., 1315 Walnut St., Phila., Pa., Separate Contracts, **$1,500,000.** RESIDENTIAL DEVELOPMENT, Penn Valley Ave., Bristol Twp., BRISTOL, PA.

▲ **Wallace Eng. & Constr. Co.,** Bryn Mawr, Pa., CA **$1,034,500,** Junior-Senior HIGH SCHOOL, Middletown, Pa., MEDIA, PA. Central Delaware County Joint School Dist., Media, Pa. Bids Apr. 14. CD 4/26, under LB.

▲ **Bender Homes, Inc.,** 1817 S. 4 St., Phila., Pa., Separate Contracts, **$1,130,000.** RESIDENTIAL DEVELOPMENT, North Wales Rd., etc., NORRISTOWN, PA.

▲ **Wilson Constr. Co., Inc.,** 305 Bedford St., Johnstown, Pa., CA **$1,962,233,** SENIOR HIGH SCHOOL, STATE COLLEGE, PA. State College Joint School Auth., State College, Pa. CD 3/21, under LB.

Ernest Di Sabatino & Sons, Inc., 260 S. 4 St., Wilmington, Del., LB, **$959,000.** Elementary SCHOOL and playgrounds, WILMINGTON, DEL. Millside School Bldg. Dist., Rogers Rd., Millside, Wilmington, Del. Bids May 11. CD 5/6.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES

June 8 Louisiana June 10 Kentucky

STREETS AND ROADS

June 8 Louisiana June 10 Kentucky

† **La., Lake Charles**—RECREATION GYMNASIUM—BA 6/15—U. S. Eng., P.O. Box 1229, Galveston, Tex., recreation gymnasium, Lake Charles Air Force Base, ENG-41-243-55-77. $100,000-$500,000.

BIDS ASKED—BUILDINGS

▲ **Ky., Louisville** — MOTEL and RESTAURANT — Bids Asked—Brown Hotel Co., Fourth and Broadway, motel and restaurant, Goldsmith Lane and Bardstown Rd. $1,500,000. Neal J. Campbell, 911 Locust St., St. Louis, Mo., engr. CD 2/8.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Merritt-Chapman & Scott Corp.,** 260 Madison Ave., New York, N. Y., CA Est. **$20,000,000-$25,000,000.** toll road from Fernandina Beach to point near Brunswick, Ga., incl. 4 bridges, 2 of them high level structures over St. Mary's and Amelia Rivers, FLORIDA. Port Authority of Fernandina Beach, Fernandina Beach, Fla. Hazelet & Erdel, 53 W. Jackson St., Chicago, Ill., engrs.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **English Constr. Co.,** Alta-Vista, Va., LB, **$1,182,976,** Dunbar High SCHOOL, LYNCHBURG, VA. Lynchburg School Bd., Lynchburg, Va. Bids May 18. CD 4/12.

▲ **Virginia Engineering Co.,** 29 St. at James River, Newport News, Va., LB, **$1,023,000.** 148 HOUSING UNITS, low-rental project, PORTSMOUTH, VA. Portsmouth Redevelopment & Housing Auth., 19 Columbus Ave., Portsmouth, Va. Bids May 17. CD 4/25.

▲† **H. L. Coble Constr. Co.,** 1705 Battle Ground Ave., Greensboro, N. C. CA **$2,798,885.** imprv. mobilization type BARRACKS, ENG-31-001-55-129, FORT BRAGG, N. C. Contg. Office, Fort Bragg, N. C. CD 4/29, under LB.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **O., Cincinnati**—SCHOOL—BA 6/14—At office Maguolo & Quick, archts., Temple Bar Bldg., Cincinnati, 3 story, brick, stone, rein.-con., steel Seton High School for Sisters of Charity, Delhi Park, Cincinnati, O. $2,400,000. CD 5/26/54.

SOON LETS CONTRACT—BUILDINGS

▲ **Mich., Owosso** — FACTORY-OFFICE — Midland Steel Corp., Owosso, soon lets contract factory-office. $1,000,000. Laucomer & Manser, 4895 Grand River, Detroit, engrs.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,
O.—**Launder & Pierce,** (Launder & Sons, Inc., & Pierce Constr. Co.), Box 56, Swanton, O. CA **$2,189,878,** est. $2,739,800. Type T-71 and structures 4.253 mi., S.R. 120-0.00, Part No. 8 Toledo Expressway System, UI-1052 (12), Lucas and Wood Counties.
O.—**Great Lakes Constr. Co. and National Engineering & Contracting Co.,** Box 2278, Brooklyn Station, Cleveland, O. CA **$1,956,090,** est. $2,241,700. Type T-71 and structures 2.895 mi. S.R. 17, Section 14.99, Village of Brooklyn Heights, village of Independence, city of Cleveland and city of Parma, Cuyahoga Co.;
O.—**C. F. Replogle Co.,** Box 308, Circleville, O. CA **$510,037,** est. $506,500. Type T-35 and structure, U.S.R. 40 Sections (5.64-7.10), Kirkwood and Union Twps., Belmont Co.;
O.—**Rhoten Constr. Co.,** 16 E. Broad St., Columbus, O. CA **$625,982,** est. $622,100. Type T-35 and structure S.R. 29, Sections (0.00-3.31), Washington and Jefferson Twps., Mercer Co.;
O.—**Smith Constr. Co. of Ohio,** P.O. Box 515, Vienna, O. CA **$217,474,** est. $249,200, Type T-71, U.S.R. 422 Sections (3.22-3.37) city of Youngstown, Mahoning Co.;
O.—**Holmes Constr. Co.,** Palmer St., Wooster, O. CA **$174,034,** est. $184,000. Type T-35 and structure S.R. 5 Sections 7.49 10.17, (Parts 1 and 2) village of Smithville, Wayne Co. Grand total $5,673,495. CD 5/19, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs. Div. Hys., Centennial Bldg., Springfield,
Ill.—**Powers-Thompson Constr. Co.,** 27 S. Chicago St., Joliet, Ill., LB, **$165,560,** dual railroad-grade separation structures, U.S. 66 over G.M.&O.R.R., Braceville, Grundy Co.; LB **$108,458,** 1 grade separation carrying S.A. 10 over U.S. 66 Grundy Co.;
Ill.—**McCann & Co., Inc.,** 812 Reisch Bldg., Springfield, Ill., LB, **$141,752,** grade separation carrying Ill. 43 over U.S. 66, Madison Co.;
Ill.—**Madison Constr. Co.,** P.O. 222, Edwardsville, Ill., LB, **$148,722,** building 2 bridges on FAS 772, Madison Co.;
Ill.—**American Bridge Div., U. S. Steel,** 209 S. La Salle St., Chicago 4, Ill., LB, **$673,029** structural steel and metal handrail for bridge over Vermilion River, U.S. 150, Danville, Vermilion Co.;
Ill.—**C. E. Burgett Constr. Co.,** R.F.D. 1, W. Mound Rd., Decatur, Ill., LB, **$104,249.** bridge over Little Wabash River and surf. course 0.31 mi. F.A.S. 706, Wayne Co.;
Ill.—**Allied Structural Steel Co.,** 20 N. Wacker Dr., Chicago 6, Ill., LB, **$1,029,119,** steel floor, cast steel structural steel for dual bridges over Des Plaines River on U.S. 66, Will Co.;
Ill.—**Culbertson Constr. Co.,** Pana, Ill., LB **$321,257,** bridge over Little Wabash River on FA 113, White and Gallatin Counties;
Ill.—**H. H. Hall Constr. Co.,** 211 S. 15 St., East St. Louis, Ill., LB, **$178,339.** dual railroad grade separation, carrying U.S. 66 over N. Y. C. and St. Louis R.R., Madison Co. Bids May 20. CD 5/11.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs. Div. Hys., Centennial Bldg., Springfield,
Ill.—**Arrow Road Constr. Co.,** 4811 S. Harlem Ave., Chicago 38, Ill., LB, **$482,923,** bit. surf. 1.93 mi. F.A.S. 135, Du Page Co.;
Ill.—**Barthelmy & Lawrence,** Casey, Ill., LB, **$92,095** bit. surf. 3.16 mi. F.A.S. 702, Cumberland Co.;
Ill.—**Bituminous Fuel & Oil Co.,** 304 Illinois Ave., East St. Louis, Ill., LB, **$136,962,** bit. surf. and 1 bridge 1.62 mi. F.A.S. 788, Clinton Co.;
Ill.—**Champaign Asphalt Co.,** 310 E. Bradley Ave., Champaign, Ill., LB, **$104,260,** c. conc. base course wid'n. bit. conc. resurf. 1.99 mi. F.A.S. 525, Champaign Co.;
Ill.—**Diamond Constr. Co.,** Quincy Ill., LB, **$91,979** bit. surf. 4.63 mi. F.A.S. 594, Adams Co.;
Ill.—**Edwardsville Constr. Co.,** 309 Bk. of Edwardsville, Edwardsville, Ill., LB, **$112,622,** bit. on grav. or crushed stone base course 1.41 mi. F.A.S. 767, Madison Co.;
Ill.—**Elston Constr. Co.,** 430 25 Ave., Rock Island, Ill., LB, **$108,845,** grav. or crushed stone surf. 3.68 mi. F.A.S. 1231, Henry Co.;
Ill.—**Truman L. Flatt & Sons, Inc.** 406 E. Monroe St., Springfield, Ill., LB, **$110,003.** bit. surf. 4.73 mi. F.A.S. 563, Sangamon Co.;
Ill.—**General Paving Co.,** Champaign, Ill., LB, **$798,792** c. conc. 8.2 mi. U.S. 45, Champaign Co.;
Ill.—**M. Hoeffken Co. & Hoeffken Bros.,** 222 W. B St., Belleville, Ill., LB, **$1,959,559,** c. conc. 7.63 mi. U.S. 66, Madison Co.;
Ill.—**Jefferson Asphalt Co.,** 1209 Casey St., Mt. Vernon, Ill., LB, **$238,980,** b. conc. resurf. and patching 7.31 mi. on various routes in Crawford, Effingham, Hamilton, Jasper, Lawrence, Mario, Marion, Shelby and Wabash, Wayne and White Counties;

Ill.—**Litchfield Bituminous Corp.**, Hillsboro, Ill., LB $126,480, bit. resurf. patching 8.2 mi. U. S. 40 Madison and Bond Counties;
Ill.—**McCann & Co., Inc.**, 812 Reisch Bldg., Springfield, Ill., LB, $144,841 c. conc. patching 2 mi. F. A. S. 542, Piatt Co.;
Thomas Mc Queen Co., 1313 S. Cicrle Ave., Forest Park, Ill. and **W. J. Sheppard Co.**, 1412 Altgeld St., Chicago, 14, Ill., LB, $1,391,749, c. conc. 0.5 mi. Chicago, Cook Co.;
Ill.—**H. H. Mass Constr. Co.**, Huntley Rd., Algonquin Ill., LB, $91,804, soil cement base course 7.48 mi. F. A. S. 1191, Whiteside Co.;
Ill.—**Quad City Constr. Co.**, 644 25 Ave., Rock Island, Ill., LB, $76,122, c. conc. 0.25 mi. U. S. 67, Rock Island, Rock Island Co.;
Ill.—**Rein & Dahl Contractors**, Stoughton, Wis., LB, $249,799, bit. on grav. or crushed stone 5.29 mi. F. A. S. 65, Jo Daviess Co.;
Ill.—**Rockford Black Top Constr. Co.**, 1615 Westchester Rd., Rockford, Ill., LB, $113,604, earth grading 6.84 mi. F. A. S. 62 and 63, Stephenson Co.;
Ill.—**Rock Road Constr. Co.**, 5915 Rodgers Ave. Chicago, 30, Ill., LB, $86,803, b. conc. resurf. 1.34 mi. S. B. I. 4 and 18 (Ogden Ave.) Chicago, Cook Co.;
Ill.—**Swords & Dietz**, 107 S. Jefferson Ave., Peoria, Ill., LB, $91,297, grav. or crushed stone base course 3.98 mi. F. A. S. 1384, Peoria Co.;
Ill.—**Zimmerly Constr. Co.**, Marshall St., Paris, Ill., LB, $153,455, bit. surf. 3.86 mi. F. A. S. 670, Edgar Co. Bids May 20. CD 5/11.

BUILDINGS

LOW BIDS AND CONTRACTS

Glaser & Glaser, Inc., 704 E. Willard St., Muncie, Ind. CA $869,900, 2 Elementary SCHOOLS, KOKOMO, IND. School City of Kokomo, Kokomo, Ind. Bids May 18, awarded May 19. CD 4/27.

Tudor Constr. Co., 614 W. Lake St., Wauconda, Ill., CA $834,000. 6 SCHOOL addns., BERWYN, ILL. School Dist. 100, 6539 W. 26 St., Berwyn, Ill. Awarded May 16. CD 3/23, under LB.

▲ **R. B. Woodring**, 8731 S. Merrimac St., Oaklawn, Ill., Own Forces, $1,200,000, 60 HOMES, Oak Lawn Area, near CHICAGO, ILL.

▲ **Northbrook Contractors**, 1200 Dell Rd., Northbrook, Ill., Own Forces, $6,600,000. 300 HOMES, DEERFIELD, ILL. A. J. Del Bianco, 5501 Irving Park Rd., Chicago, Ill., archt.

▲ **Joseph Giase**, 6937 North Ave., Oak Park, Ill., Own Forces, $2,500,000, 165 HOMES, near ELMHURST, ILL.

▲ **City Wide Builders**, 5400 Elston St., Chicago, Ill., CA $1,000,000, 83,800 sq. ft. FACTORY and 20,000 sq. ft. OFFICE, 222 Hartrey Ave., EVANSTON, ILL. Shure Bros Inc., 225 W. Huron St. Chicago, Ill. Bids May 2, awarded May 18. CD 4/21.

Giase Brothers Constr. Co., 574 N. Laramie St., Chicago, Ill. Own Forces, $900,000. 55 HOMES, GLEN ELLYN, ILL.

▲ **Bel Aire Homes, Inc.**, 2538 S. Michigan St., Chicago, Ill. Own Forces, $5,500,000. 400 HOMES, MARKHAM, ILL. W. B. Cohan, 624 S. Michigan St., Chicago 5, Ill., archt.

▲ **Gleich Constr. Co.**, 516 E. North West Hy., Mount Prospect, Ill., Own Forces, $7,290,000. 18 APARTMENTS, MOUNT PROSPECT, ILL.

▲ **Hatlen Constr. Co.**, 8324 Farragut St., Chicago, Ill. Own Forces, $6,000,000. 300 HOMES, sewage, water and paving, MOUNT PROSPECT, ILL. James Viger, 1000 N. West Hy., Mt. Prospect, Ill., archt.

▲ **J. M. Brickman Constr. Co.**, 823 Lawrence Ave., Chicago, Ill. Own Forces, $1,600,000, 80 HOMES, near MOUNT PROSPECT, ILL. James Viger, 666 E. Northwest Hy., Mt. Prospect, Ill., and A. J. Del Biano, 5501 Irving Park St., Chicago, Ill., archts.

Power Constr. Co., 125 N. Marion St., Oak Park, Ill., LB $969,999. intermediate SCHOOL, WAUKEGAN, ILL. School Dist. 61, 574 McAllister St., Waukegan, Ill. Bids Apr. 27, awarded May 12. CD 4/19.

▲ **Haglund & Ames**, 123 Greenwood St., Waukegan, Ill., CA $1,406,017. HOSPITAL addns., 1324 Sheridan St., WAUKEGAN, ILL. Victory Memorial Hospital, 1324 N. Sheridan St., Waukegan, Ill. Bids Mar. 23, awarded May 13. CD 4/12, under LB.

▲ **Power Constr. Co.**, 125 S. Marion St., Oak Park, Ill., LB $2,365,852, Lyons Twp. Branch High SCHOOL, WESTERN SPRINGS, ILL. School District 204, c/o Lyons Twp. High School, LaGrange, Ill. Bids May 10. CD 4/29.

Giase Bros. Constr. Co., 574 N. Laramie St., Chicago, Ill., Own Forces, $900,000. 55 HOMES, WHEATON, ILL.

▲ **Bd. Educ.**, 122 Mappa St., Eau Claire, Wis., rejected bids Mar 16, SENIOR HIGH SCHOOL, EAU CLAIRE, WIS. LB $1,715,000. Will re-advertise. CD 3/24, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† **N. M., Alamogordo**—DORMITORIES—BA 6/15—U. S. Eng., Box 538, Albuquerque, six 3 story, 40x200 ft. concrete, masonry airmen's dormitories, Holloman Air Development Center, ENG-29-005-55-68, $750,000-$1,500,000. CD 5/17.

▲† **Arkansas**—BA 6/21—U. S. Eng., P. O. Box 60, Vicksburg, Miss., constr. Bouef River Channel imprvts., Reach BR-5, Mile 196.1 to Mile 220.0 and Reach BR-6, Mile 220.0 to Mile 235.5 along Boeuf River between Mile 196.1 and Mile 235.5 in Chicot Co., from immediately north of Louisiana-Arkansas State line to approx. 500 ft. upstream of Missouri-Pacific R.R., approx. 9 mi. northwest of Lake Village.

BIDS ASKED—BUILDINGS

▲ **Tex., Galveston**—DORMITORIES, etc.—BA 6/21—University of Texas, Bd. Regents, Tom Sealy chn., Main Administration Bldg., Austin, 3 dormitories, cafeteria, lounge, power plant unit and faculty housing, Galveston Medical Branch, $1,345,000. Plans deposit $25. Cameron Fairchild & Assocs., 2626 W. Dallas St., Houston, Tex., archts. CD 11/10.

▲ **Tex., San Antonio**—Bids Asked—SHOPPING CENTER—Northview Corp., c/o Jno. B. Mills, Mercantile Securities Bldg., Dallas, 390,000 sq. ft. masonry main bldg., shopping center, Vance Jackson Rd. and Spencer Lane, $5,000,000. Walter P. Moore, 2 Pinedale St., and Jerold L. Davis, 9240 Kenilworth St., Houston, engrs. Harvin C. Moore, 2006 W. Alabama St., Houston, archt. CD 5/24.

SOON LETS CONTRACT—BUILDINGS

▲ **Tex., Tyler**—PLANT, etc.—General Electric Co., 570 Lexington Ave., New York, N. Y., soon lets contract home cooling unit mfg. plant, $12,500,000; warehousing storage, $300,000; pavement and general road work in plant zone, incl. auto parking area center, $200,000; water system, $80,000; sanitary-storm sewers, $90,000; plant area general earthwork, grading, filling and leveling, $67,500; natural gas distr. lines, $75,000. Outside area and plant outside lighting system $80,000. Walter Kidde Constructors Inc., 140 Cedar St., New York, N. Y., engr. CD 3/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **KANSAS**—Kansas Turnpike Auth., 2306 W. 10 St., Topeka,

Cook Constr. Co., P.O. Box 1151, Jackson, Miss. CA $710,811. grading, drainage 4.66 mi. Proj. 2-7-E (1), Sedgwick Co.; CA $631,695. grading, drainage 4.79 mi., Proj. 2-8-E (1), Sedgwick Co. CD 5/19, under LB.

▲† **Northwestern Eng. Co.**, 1311 St. Joe St., Rapid City, S. D. LB $3,216,919, est. $3,030,032. heavy-duty primary runways, taxiways, alert taxiway, parking apron, misc. jet-blast paving, etc., Glasgow Air Force Base, Inv. 55-28; GLASGOW, MONT. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids May 19. CD 4/20.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Naugle-Leck, Inc.**, Baker Bldg., Minneapolis, Minn. CA $5,000,000. 8 story BANK addn. on top of existing bldg., remodel existing bldg., MINNEAPOLIS, MINN. Federal Reserve Bank of the Ninth District, 75 S. Fifth St., Minneapolis, Minn. CD 5/24, under LB.

▲ **John B. Gutmann Consctr. Co.**, 1301 S. Vandeventer Ave., St. Louis 10, Mo. CA Total est. $6,000,000. general contract, 16 story, bsmnt., 100x188 ft. 213-unit APARTMENT, Kingshighway and West Pine Blvd., ST. LOUIS, MO. Joseph A. & John J. Campagna, et al, c/o Montclair Apartments, 18 S. Kingshighway, St. Louis 8, Mo. Sylvian Bien & Robert L. Bien, 33 W. 46 St., New York, N. Y., archts. Muzzillo & Tizian, 15 W. 46 St., New York, N. Y., mech. engrs. Wells & Wells, Security Bldg., St. Louis 2, Mo., engrs.-archts.

▲ **J. E. Morgan & Son**, Box 6029, Dallas, Tex., LB $1,136,807, masonry, fireproof TEMPLE, incl. 38 Sunday School rooms, Hillcrest and North West Hy., DALLAS, TEX. Temple Emanuel, Hawood and South Blvd., Dallas, Tex. Bids May 17. CD 5/2.

▲† **Ottinger Constr. Co.**, Box 12035, Fort Worth, Tex., CA $1,001,799, four Bachelor Officers QUARTERS, ENG-41-443-55-116, FORT HOOD, TEX. U. S. Eng., Box 1600, Fort Worth, Tex. Bids Apr. 27. CD 5/2, under LB.

▲† **Madden Constr. Co.**, 1705 Minden Rd., Bossier City, La., CA $2,528,697, rehabilitation and imprv. 58 enlisted men's BARRACKS, Inv. No. AIV 41-093-55-207, FORT HOOD, TEX. U. S. Govt. Purch & Contg. Offices, Fort Hood, Tex. Bids Apr. 25. CD 5/2, under LB.

▲ **Missouri Valley Eng. & Constr. Co.**, 787 S. Willett St., Memphis, Tenn. and **Winston Bros. Constr. Co.**, 1470 Northwestern Bank Bldg., Minneapolis 2, Minn., CA, $3,500,000. Electric POWER PLANT, FORT WORTH, TEX. Texas Electric Service, Electric Bldg., 408 W. 7 St., Fort Worth, Tex. CD 3/6/53.

▲ **Candoo Constr. Co., Inc.**, 7311 Almeda St., Houtson, Tex., CA $1,000,000. WAREHOUSING-OFFICE, HOUSTON, TEX. Grocers Supply Co., Inc., 11 N. Jackson St., Houston, Tex. CD 5/24.

▲ **Union Oil Co.**, Midland, Tex. CA $1,000,000. 10 story, 70,000 sq. ft. OFFICE, MIDLAND, TEX. T. A. Fraser, 1804 Kentucky St., Midland, Tex. CD 5/4.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Calif., Los Angeles**—BA 6/17—Los Angeles Flood Control Dist., 2250 Alcazar St., Proj 221, Laguna Wash Storm drain, ALhambra, $1,000,000. H. E. Hedger, c/o owner, engr. CD 11/7/52.

BIDS ASKED—BUILDINGS

Calif., Long Beach—AUDITORIUM—BA 6/10—Long Beach Bd. Educ., 715 Locust Ave., auditorium at Long Beach City College, $950,000. Jess J. Jones, 1870 American Ave., archt. CD 7/18/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Macco Corp.**, 4409 S. Paramount Blvd., Paramount, Calif., **Peter Kiewit Sons Co.**, 1024 Omaha Natl. Bank Bldg., Omaha 2, Neb., **Stolte, Inc.**, 8451 San Leandro St., Oakland 5, Calif., and **Morrison-Knudsen Co., Inc.**, Box 450, Boise, Idaho, LB $31,200,000. Donnells and Beardsley Power Proj. (Tuolumne Proj.) Stanislaus River, Sierra Nevada, CALIFORNIA. Oakdale Irrigation Dist. & South San Joaquin Irrigation Dist., 322 D St., Oakdale, Calif. Bids May 23. CD 5/4.

BUILDINGS

LOW BIDS AND CONTRACTS

Biltmore Homes, Inc., 232 W. Canon St., Beverly Hills, Calif., CA, $908,600, 92 frame, stucco DWELLINGS, Vanna and Treves Dr. and Orange Ave., BELLFLOWER, CALIF. Whittier Savings & Loan Assn., 210 E. Philadelphia St., Whittier, Calif.

▲ **Lakewood Estates Housing Co.**, 11687 San Vicente St., Los Angeles, Calif., Owner Builds, $1,736,400. 120 frame, stucco dwellings, Damland, Dashwood and Denmead Sts., LAKEWOOD, CALIF.

Millie & Severson, 1485 Canal St., Long Beach, Calif., CA, $800,000, 140x382 ft. MANUFACTURING and SALES BLDG., LONG BEACH, CALIF. L. S. Whaley Co., 5512 Britton Dr., Long Beach, Calif. Welton Beckett & Assocs., 5857 Wilshire Blvd., Los Angeles, Calif., engrs.

Godbey Development Co., 10820 Norwalk Blvd., Santa Fe Springs, Calif., CA, $873,000. 97 frame, stucco DWELLINGS, Lowell, Romana and Olive Sts., SANTA ANA, CALIF. Santa Ana Park Estates Unit 2, 10820 Norwalk Blvd., Santa Fe Springs, Calif.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Canadian Westinghouse Co. Ltd.**, 286 Sandford St. N., Hamilton, Ont., CA, $1,250,000, supply, install thirteen 60-cycle transformers for St. Lawrence Power Proj. at Cornwall, ONTARIO. Ontario Hydro-Electric Power Comn., 620 University Ave., Toronto, Ont. Bids Apr. 5, awarded May 20. CD 3/4.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Burns & Dutton Concrete & Constr. Co. Ltd.**, 9004 125 Ave., Edmonton, Alta., CA, $8,000,000. portland cement PLANT, 20 bldgs., EDMONTON, ALTA. Inland Cement Co. Ltd., Norgate Bldg., Edmonton, Alta. Awarded May 10. CD 2/11.

▲ **Bird Constr. Co. Ltd.**, Sargent and Erin Sts., Winnipeg, Man., LB, $3,136,657, Deer Lodge Veterans HOSPITAL addn. St. James suburb, WINNIPEG, MAN. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 18. CD 3/29.

▲ **Principal Investments Ltd.**, 133 Richmond St. W., Toronto, Ont., Owner Builds, $2,500,000, SHOPPING CENTER, on former Cedarbrae Golf Course, Lawrence Ave. and Markham Rd., 170-acre site, TORONTO, ONT.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Alaska, Sitkinak**—COMPOSITE BLDG.—BA 6/23—U. S. Eng., 4735 E. Marginal Way, Seattle ,Wash., composite bldg., paint and oil storage bldg., air-to ground bldg., segregated magazine storage bldg., air-strip work, etc. for Air Force Station, Inv. 55-31. $4,000,000. Plans deposit $30. (change in bid place). CD 5/20.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Morrison-Knudsen**, Anchorage, Alaska, LB $1,057,829 est. $2,198,603, $2,003,053 est. $2,364,027, Alternate paving, taxiway, lighting; LB $79,800, est $95,100 for clearing and grading, Elmendorf Air Force Base, Inv. 55-54, ALASKA. U. S. Eng., Anchorage, Alaska, Bids May 20. CD 4/14, Six bidders;
Green & Birch, 428 Securities Bldg., Seattle, Wash. LB $1,195,369, est. $841,942, paving access aprons Ladd Air Force Base (Alaska);
Peter Kiewitt Sons Co., 1300 Aloha St. Seattle, Wash. LB $359,325, est. $444,373. alert taxiway rehabilitation; LB $84,182, est. $94,535, alert taxiway lighting; LB $194,730, est. $180,205; paving driveway and parking areas for organizational maintenance shops, Ladd Air Force Base, (Alaska);
Reed & Martin, Fairbanks, Alaska, LB $202,000, est. $217,285. communication sys. Ladd Air Force Base. (Alaska).

AMERICANS ABROAD

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Pittsburgh-Des Moines Co.**, Neville Island, Pittsburgh, Pa., U. S. A., and **Intrecanles Co.**, Madrid, Spain, LB $6,277,716. terminal storage facilities, various locations in connection with Spanish Air Force Bases for Bureau Yards & Docks, SPAIN. Brown-Raymond-Walsh, 122 E. 42 St., New York, N. Y., prime contractors. CD 4/14, under LB.

▲† **Merritt-Chapman & Scott Corp.** and **B & B Co.**, 260 Madison Ave., New York, N. Y., CA $4,809,660 475 mi. pipe line from Rota to Zaragoza in connection with Air Force Bases for Bureau Yards & Docks, SPAIN. Brown-Raymond-Walsh, 122 E. 42 St., New York, N. Y., prime contractors. CD 4/14, under LB.

(Proposal Advertisements see pp. 167 to 170)

One of Rowe Construction's 50 pieces of heavy machinery

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"Up to 12,000 hrs. before overhaul with Cities Service C-300 Motor Oil," says Delmar Rowe.

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Rowe's choice of Cities Service Lubricants was no hit-or-miss proposition. "At that time," he says, "I'd had 23 years observing down-to-earth lubrication problems with construction machinery...and I was determined to find lubricants that gave the down-to-earth performance to solve these problems. Cities Service supplied the answer."

HOW RIGHT WAS ROWE? His Cat motors are a good example. They now run as long as 12,000 hours before overhaul using Cities Service C-300 Motor Oil. He reports: "There's no sludge or carbon problem and bearing life has been excellent. Other pieces of equipment show similar results. Obviously, we're saving on maintenance costs, and obviously it's showing up in the profit column."

Delmar Rowe is but one more construction man who's found Cities Service Lubrication the road to increased efficiency, lowered costs. Why not learn what it can do for you? Contact your nearest Cities Service representative or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

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UNIT PRICES

Power Plant at Buford Dam, Georgia

A $3-million award for the 86,000-kw Buford Dam powerhouse, switchyard and transformer yard went to Ivey Brothers Const. Co., lowest of five bidders. These power facilities are part of Buford earthfill dam being built on Chattahoochee River about 35 mi. northeast of Atlanta for the Army Corps of Engineers. Colonel Harold E. Bisbort is Mobile District Engineer.

The 205x105x130 ft concrete powerhouse building, to house two 40,000-kw and one 6,000-kw generators, will cost $288,404. This is $91,596 under the second low bid and lead factor in the Ivey award. The building will have structural steel roof framing, structural tile partitions, plastered walls and ceilings; rubber, quarry and ceramic mosaic tile floor finishes; glazed wall tile wainscots, hollow metal doors and frames, and built-up roofing. The Government will furnish equipment marked "i," to be installed by the contractor; the contractor will furnish and install other items.

Work is 8 mi from the railhead at Buford, Ga., accessible by bituminous-surfaced access and county roads. The contractor will unload and transport or store government-furnished equipment whether delivered fob railhead or fob truck at project.

Switch- and transformer-yard work covers surfacing 160x22-ft and 75x 235-ft areas, installing structures and equipment. The embankment is under another contract.

Minimum prevailing wage rates include: construction laborers $1.33 per hr, small air tool operators $1.35, structural ironworkers $2.85, electricians $3.00, plasterers $2.75, plumbers and steamfitters $3.05, air compressor operators $2.00, concrete mixer operators over 5 bags $2.10.

1C Ivey Brothers Const. Co., Atlanta, Ga.	$3,076,138
2 Hardaway Const. Co., Nashville, Tenn.	3,165,501
5 Farnsworth & Chambers Co., Inc., Houston	3,574,796

Bids 5-3-55 Items	Unit	Quantity	Unit Prices 1C	2
Powerhouse:				
Cofferdam & unwatering	ls	1	$146,022	$60,000
Excavation, unclassified	cy	13,390	12.00	12.00
Foundation preparation	sf	20,300	1.00	0.90
Drill draft tube weep hl.	ls	.....	5,334	4,000
Scaling	MH	400	10.00	12.00
Line drilling	sf	1,900	2.00	1.00
Scroll case concrete pipe.	ls	.....	3,500	6,000
Concrete:				
thin walls & slabs	cy	9,100	46.00	50.00
mass & thck wll & slab	cy	14,800	36.00	25.00
in recesses	cy	17	45.00	100.00
porous	cy	50	19.00	50.00
Cement, portland	bbl	30,700	4.60	6.00
portland used with nat or slag cement	bbl	23,000	.....	.....
natural	bbl	7,700	.....	.....
slag	bbl	7,700	.....	.....
Scroll case leakage drain system	ls	1	10,000	2,500
Cork-tar mastic 7000SF.	ls	1	13,200	11,000
Sep conc floor finish	sf	24,250	0.35	0.60
Steel reinforcement	lb	1,280,000	0.21	0.13
Copper water stops	lb	3,650	1.10	2.00
Powerhouse building	ls	1	288,404	380,000
Mechanical equipment:				
Draft tube gates & guides 49 tons	ls	.....	31,396	40,000
Heatg, vent, air conditn.	ls	.....	104,829	116,000
Sanit & treatd water sys.	ls	.....	35,628	39,000
Raw water piping system	ls	.....	31,610	35,000
Unwaterg & drainage sys	ls	.....	37,146	41,000
Compressd air pipg sys.	ls	.....	10,500	12,000
Oil piping systems	ls	.....	48,167	53,000
Hydraulic gage & piezometer piping	ls	.....	6,216	7,000
Unwaterg & drainage pumps	ls	.....	10,201	12,000
Oil purification equip	ls	.....	44,289	49,000
Compressed air equip	ls	.....	12,650	14,000
Water treatment equipmt	ls	.....	13,609	15,000
Sewage disposal equipmt	ls	.....	9,103	10,000
Valve operating units	ls	.....	3,380	5,000
Painting penstocks	ls	.....	26,000	30,000
Penstock #3 extension, l.	ls	.....	3,600	1,500
Elev mach rm support bm & rail supports, inst	ls	.....	1,400	300.00
Turbines, 55,000 hp, 900 t, i	ls	.....	150,100	150,000
8,400 hp & butterfly vlve 109 t, i	ls	.....	33,400	21,000
Governors, install	ls	.....	24,000	16,000
Powerhse crane, 400 t, l.	ls	.....	14,747	15,000
Drft tube gntry crane & hoist followr, 36.5 t. l.	ls	.....	5,378	4,000
CO_2 equipment, install	ls	.....	3,022	4,000
Machine shop equip, l.	ls	.....	222.00	6,000
Electrical equipment:				
Generator switchgear, l.	ls	.....	15,300	20,000
Control switchboards, l.	ls	.....	5,040	4,000
Sta service equipment, l.	ls	.....	12,150	16,500
Steel cond & fitgs,	lb	63,406	0.45144	1.00
Metal wireway	ls	.....	1,440	2,000
Asb cmt cond & fitgs	lb	2,430	0.45	0.40
Flexible steel conduit	lb	250	1.215	6.50
Grounding system	lb	10,887	1.728	5.00
Ins lightg wire 0-600 v all sizes	lb	2,084	2.133	5.50
Ins power wire 0-600 v, #8 AWG & over	lb	16,199	1.512	1.00
601-1,000 v, #10 AWG & smaller	lb	1,940	1.945	2.50
Ins control wire 601-1,000 v, all sizes	lb	32,781	1.80	1.80
Ins wire, ungrounded all size 3,001-4,000 v	lb	2,700	1.728	1.50
5,001-6,000 v	lb	1,300	1.665	1.50
14,001-15,000 v rubber covered	lb	3,770	1.889	2.00
15,000 v paper-ins, lead covered	lb	35,500	1.08	1.00
23 kv potheads at gener	ls	.....	1,620	3,000
Lighting systems	ls	.....	33,300	32,000
Starting & control equip	ls	.....	2,970	2,800
Telephone & code-call	ls	.....	16,200	12,000
Cable trays, racks, supports	ls	.....	17,130	31,000
Underground duct sys.	ls	.....	39,960	120,000
Sw & transf yd equip, l.	ls	.....	39,980	53,000
Generator fndn bolts & soles plates, l.	ls	.....	1,305	3,000
Unload & store generators, 1,266 t	ls	.....	10,000	12,000
Transformer & switchyard:				
Transformer transfer trck	ls	.....	5,111	5,000
Fences, swyd, transf yd, & berm	ls	.....	8,021	7,500
Switchyard gravel surf.	cy	915	3.75	7.00
Concrete, misc exterior	ls	.....	23,549	43,000
Exterior drainage syst	ls	.....	5,500	5,000
Subgr, rdwys & parkg	ls	.....	800.00	5,000
Gravel sub-base crse	cy	513	3.90	4.00
Asphalt surfacing	sy	16,000	2.00	3.00
Guard rail	lf	5,800	3.50	4.00
Sprigging	ac	1.5	400.00	300.00
Street lightg access rds & elec conn to res area	ls	.....	14,066	21,000

Completion schedule, by sections to permit next stage of job to proceed:

- Storage warehouse 45 calendar days; liq damages $50/day
- One 40,000-kw generator unit 12-31-57; $500/day
- 6,000-kw generator unit 1-30-57; $200/day
- Second 40,000-kw generator unit 4-30-57; $500/day
- Entire work including final cleanup 6-30-57; $250/day

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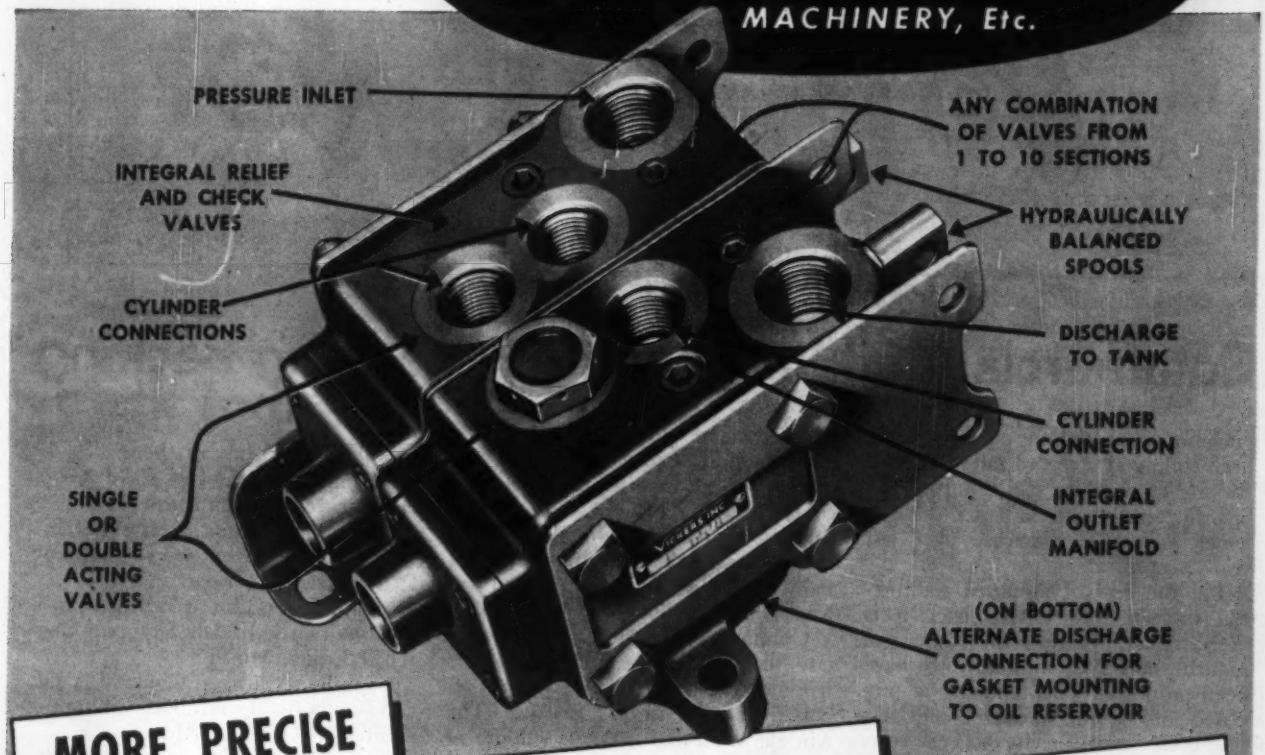
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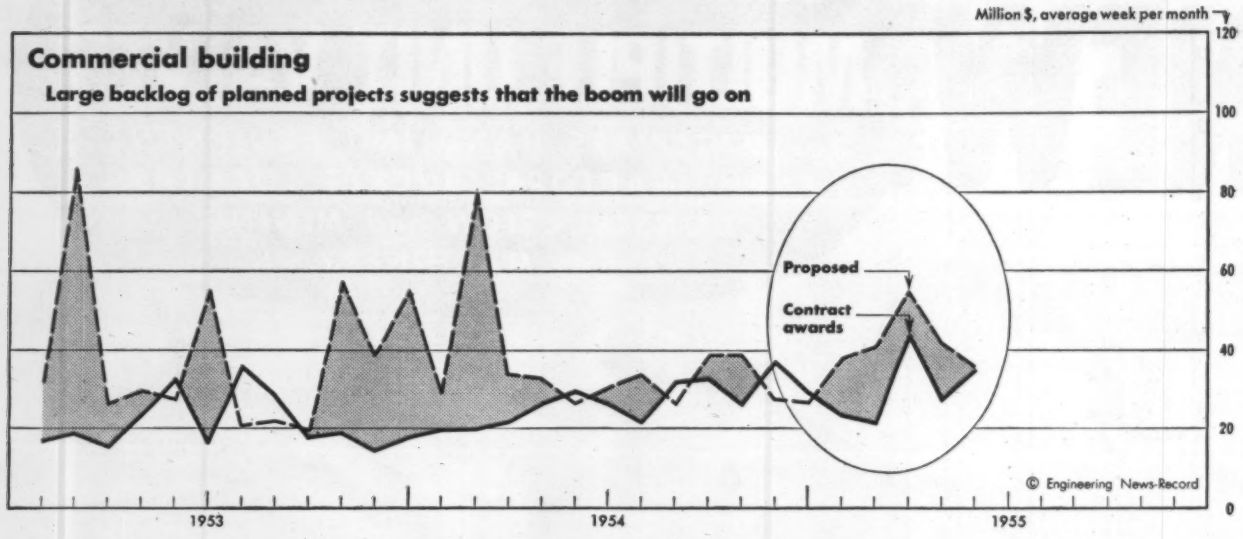
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



Commercial Building Boom Has Strong Backing

Commercial building contracts have been rolling at a record rate this year. Awards reported to ENR during the first five months total $665 million, which is a 30% increase over last year's record.

But the flow of proposed commercial projects into ENR's backlog is even higher. During the same five months, over $900 million worth have been proposed. This tendency of proposed jobs to run ahead of contracts has been going on for several years (chart, above). But the increase in the backlog does a lot to explain why commercial building made new highs in 1953 and 1954, and why it is booming this year. Last fall, ENR forecast that commercial contracts would climb 6% this year. The 30% gain recorded up to the present time is well ahead of that projection.

• **Basis for boom**—The boom will probably continue on into 1956. For the shift of our population to the suburbs is creating a strong demand for shopping centers and suburban stores. Such contracts make up a sizeable proportion of ENR's commercial awards.

• **Regions**—Here's how commercial awards look on a regional basis: The Middle Atlantic is way out in front with $265 million, nearly twice as much dollar volume of contracts as in any other region. This area also shows the sharpest percentage rise over 1954—an 83% gain.

Contractors are also doing more commercial construction than last year in the West-of-Mississippi area, where contracts are up 24% to $136 million. Business is up 15% in the South, with awards totaling $43 million. In the Far West, awards are up 9% and the total is $40 million.

Commercial volume is a little below last year in New England and the Middle West. New England is off 5% for a total of $27 million. The Middle West has a dollar volume of $143 million, 2% below the same 1954 period.

• **Types of construction**—Though there have been several sizeable awards for banks and office buildings this year, most of the big commercial awards have been for shopping centers. Here are some of them:

$23-million Roosevelt Field Shopping Center at Hempstead, L. I.

$20-million center at Hillside, Ill.

$10-million Mondawin Shopping Center near Baltimore.

$10-million center at Wheaton, Md.

$7-million Southdale Shopping Center at Edina, Minn.

$5-million center at Concord, Calif.

$3-million Twinbrook Shopping Center at Rockville, Md.

$2.5-million center in Kansas City, Mo.

$2-million University Hills Shopping Center No. 2 in Denver, Colo.

• **Banks and office buildings**—Contracts for other types of commercial buildings let this year include the following major projects:

$10-million bank for Bank of New York

$6.3-million, 20-story office building in New York City

$4-million, 14-story office building in Chicago for American Fire Insurance Group, of New York

$3-million bank, with offices and drive-in, for First National Bank & Trust, Oklahoma City

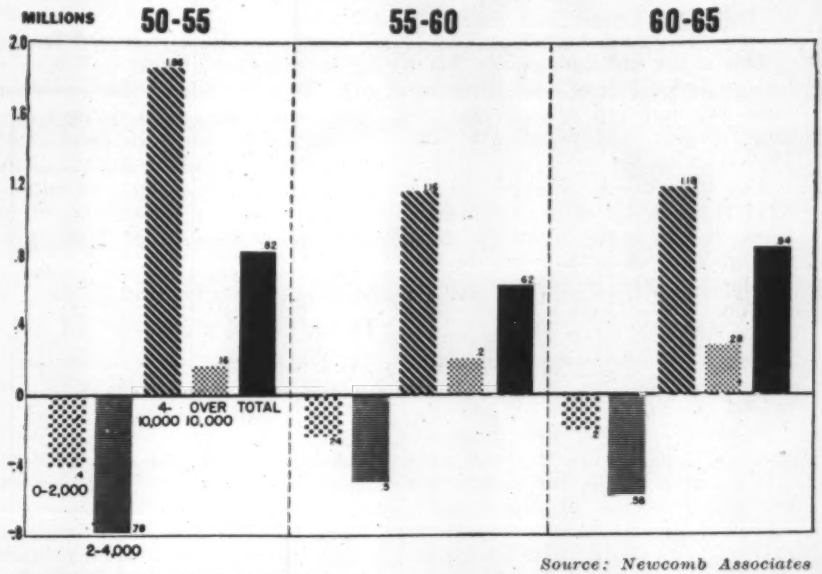
These large projects account for only a fraction of the $665-million total so far this year. And it does not include all the types of buildings that are part of this category, which also covers hospitals, private schools and colleges, and other private institutions.

Failures This Year Are Close to 1954 Record Level

This year's tough competition is keeping contractor failures at a high rate. For the first four months, Dun & Bradstreet reports that failures in the industry are only 4% under the record high set in 1954. Failures in May should come close to the levels of March and April.

Building subcontractors seem to be in the most trouble. Failures in this group have been running slightly above last year. Failures among building contractors are down about 13% from last year's peak. Other contractors—non-building heavy construction—account for only a small part of total failures.

Annual Rate of Change in Number of Households, by Size of Income



Source: Newcomb Associates

FUTURE CUSTOMERS—Though the annual increase in households is expected to decline in the later 1950s, there should be a gain of about 1.2 million households each year in the important $4,000-$10,000 income group.

Brick Industry Is Expecting A Long-Term Housing Boom

The brick and tile industry has decided it should plan future expansion of production facilities on the basis of over one million new homes annually for at least the next five years.

Douglas Whitlock, board chairman of the Structural Clay Products Institute, announced in New York last week that his trade association would assume from now on that there will be no serious decline in housing starts for the rest of the 1950s.

So far this year, starts have been running at an annual rate of between 1.3 million and 1.4 million. Conservatives have warned that the current high rate of homebuilding may be borrowing from future demand, and that starts will turn down before long. The institute itself does not attempt to make an exact forecast. It assumes that home starts will stay above the 1-million mark.

The brick and tile industry also expects that its share of the housing market will increase. It estimates that in 1954 about 29% of all new homes were built with solid brick or brick veneer—a 16% gain during the past decade. However, the institute has no figures as yet on current expansion plans by brick manufacturers.

• **Newcomb analysis**—The institute's optimism is based on a study of the housing market by Robinson Newcomb, well-known construction analyst. Newcomb believes that formation of new households and demolition of existing homes are not the only factors that should be considered in making an estimate of future housing demand.

He believes that the constant upgrading of the income of U.S. households should also be taken into account. The net increase in households is estimated at only about 600,000 this year, less than half the current rate of home starts. But Newcomb points out from government figures that each year the number of households in the lowest income brackets is declining, while a large number of households are moving into the $4,000-$10,000 income bracket, where probably for the first time they will be potential customers for new homes.

• **1.2 million a year**—Newcomb believes that it is conservative to estimate that during the next decade there will be a net increase of about 1.2 million households each year in the $4,000-$10,000 income bracket (chart, above), either through upgrading from lower brackets or through formation of new households. The $4,000 to $10,000 figures are in terms of constant 1950 dollars. He assumes that the U.S. will continue to enjoy moderate prosperity, with no serious or prolonged recessions.

In other words, although it seems likely that the total number of U.S. households may increase only about 600,000 a year during the rest of the 1950s, the number of households in this important income group should continue to increase about twice as fast.

In the early 1960s, Newcomb forecasts that the total number of households should increase at the rate of over 800,000 a year, as the children born in the first stages of our "baby boom" start forming households of their own.

In addition, Newcomb estimates that the new-home market will be strengthened by an annual rate of about 400,000 home demolitions during coming years. This is a higher figure than is usually estimated for this category.

• **FRB analysis**—The Federal Reserve Board has also just published an analysis of the housing market, which indicates that it expects homebuilding to continue at a very high level for some time in the future. But FRB is cautious about making any long-term predictions.

Here are some of the highlights of the FRB study:

• Population in the U.S. is now increasing about 2½ million each year. That's about three times the average annual increase that took place during the 1930s, and about 50% above the 1920s.

• There are still about 1½ million married couples without separate households of their own. However, in the past two years declines in the number in this group have been small, and further changes may also be small.

• Part of the boom is based on the increasing tendency of young unmarried people to maintain separate households apart from their families. Between 1950 and 1954 there was an increase of 1.2 million in unrelated individuals as household heads as compared with an increase of 1.8 million for married couples.

• Though, in general, mortgage borrowers in the years before 1954 now have an "appreciable" equity in their houses, a high proportion of current home purchases are done on very liberal credit terms. VA loans so far this year have been accounting for about 28% of private home starts, compared with 18% a year ago. And a little more than 40% of VA-insured home loans are currently being made with no down payment. That is the highest proportion since the boom year of 1950.

(*B&F continued on page 158*)

A-Power Must Go Far to Beat New Coal-Using Generators

Enthusiasts over the limitless future of atomic power got some dampening advice last week from a leading utility executive. Philip Sporn, president of American Gas & Electric Co., believes that the two huge coal-burning plants now being built in the Ohio Valley to supply the enormous power needs of the Atomic Energy Commission's Portsmouth plant will probably still be competitive in production cost "well beyond the time when the plants are worn out."

• **World's most efficient**—Sporn expects that the plants, Clifty Creek and Kyger Creek, will be able to deliver power for less than 3.8 mills per kwh, which he says would make them the most efficient plants in the world so far. And he believes that future plants using conventional fuels can be even more efficient.

Present projections of the cost of power from atomic fuel are that large A-plants will be able to produce power in the range of from four to seven mills in the mid-1960s, after substantial development and after commercial experience. By that time, A-plants will be competitive with many existing conventional power plants. But they will not necessarily be as efficient as new plants using conventional fuels, depending on accessibility of fuel.

Clifty Creek and Kyger Creek are being built by Ohio Valley Electric Corp., jointly owned by 15 utilities which have contracted to supply power to the AEC Portsmouth plant. The first is near Madison, Indiana; the other is under construction near Cheshire, Ohio. Clifty Creek, with generating capacity of almost 1.3 million kw, will be the largest privately owned steam plant in the world. Kyger Creek's capacity will be close to 1.2 million kw.

The AEC's plant at Portsmouth is expected to use about 16.5 billion kwh annually. That's around 25% more than the annual power consumption of New York City.

Private Lenders Outdo U.S. In Loans for Slum Clearance

U. S. cities now are getting more money from private lenders than from direct federal loans to finance federally assisted slum clearance projects now under way, Urban Renewal Commissioner James W. Follin announced this week.

As of April 30, 1955, the total amount of private loans outstanding for Title I slum clearance projects was $34 million, compared with $29 million in federal loans.

This is the first time private loans have exceeded federal loans since the slum clearance and urban redevelopment program was launched by the 1949 Housing Act.

The 1949 law authorized, and the 1954 Housing Act continued, federal loans to help cities assemble, clear and prepare land for private redevelopment. Local public agencies are encouraged to use the federal loan contract as security for a private loan when private funds are available at a lower rate than is required on federal loans.

Follin pointed out that these private loans at lower rates not only save the local community money, but the federal government as well. Interest on loans for slum clearance is chargeable to the net cost of a project, up to two-thirds of which can be underwritten by a federal capital grant. So lower interest rates reduce the amount of both the federal capital grant and the local contribution to net project cost.

Cruise Calls for Businessmen To Invest in N. Y. C. Housing

New York City businessmen should invest in the redevelopment of the metropolis because "there can be no healthy future in a city of skyscraper office buildings and luxury apartments surrounded by a sea of slums."

That is the appeal just made by Philip J. Cruise, chairman of the New York City Housing Authority. Cruise wants businessmen to form a housing investment corporation with an initial capital of $100 million to pay primary attention to housing for the middle-income group.

"I think we must recognize," said Cruise, "that there will always be a number of families—particularly those with young children—who will seek the kind of life offered by a home in the suburbs. The best city planning will not prevent this, although lack of suburban planning eventually might.

"But what we must be concerned with are the families who would prefer to stay in the city—because of the city's real advantages—but who are forced out by lack of decent housing. No one wants to see New York become a two-class city, and yet I think we recognize that there has been a trend in that direction. That trend would have been considerably more advanced were it not for the comparatively vast amount of public and publicly-assisted middle-income housing built in the city in the past several years."

Various forms of state and federal aid have helped a great deal, Cruise said. But he added that what is needed more than anything right now is more private capital. He emphasized that he was not talking only about investments by financial institutions, but also about capital from the major businesses and industries in the area.

Michigan Boosts Gas Tax To Six Cents a Gallon

A bill to build a $35-million-a-year highway construction fund by increasing the gasoline tax from 4½ cent to 6 cents a gallon was approved Wednesday by the Michigan legislature. Governor G. Mennen Williams is expected to sign it without delay.

The bill also increases commercial vehicle weight taxes approximately 10%. Funds will be divided like this: 75% to the state, about 16.5% to counties, and 8.5% to municipalities. It is expected that approximately $27 million will be collected yearly.

Critics of the bill point out that Detroit motorists will pay about $17 million of the new tax annually, while less than $3 million will be spent on roads in the metropolitan area which annually carries one-half of the state's vehicular mileage.

The measure includes a provision that either the state or local units may pledge up to one-fifth of the new money for bonds to accelerate their objectives the first year. After the first year they may pledge up to one-half of the money as backing for bonds.

FHA Withholds Commitments To Builders in 26 Areas

Commissioner Norman Mason told the House Banking Committee last week that the Federal Housing Administration is currently applying a freeze in 26 areas on firm commitments to guarantee mortgages for speculative building. He told the committee that this action was due to a temporary surplus of the housing market in these areas, which he did not identify. Dallas is known to be one of them. Mason said he believed the surplus would soon be absorbed.

The FHA freeze does not affect individuals who are seeking FHA commitments on houses they plan to build for their own occupancy. It applies only to builders who want FHA's advance guarantee on mortgages for homes they plan to build for sale.

(*B&F continued on page 160*)

Bucyrus-Erie 38-B shovel excavated one-third of total yardage on this job with rock and conglomerate predominant material.

CALIFORNIA CONTRACTOR PASSES TOUGH TEST ON FIRST BIG JOB

When this Southern California contracting firm was awarded the contract for rebuilding 8.16 miles of secondary highway in east-central California, work plans had to be made carefully. A few of the reasons: the job was in a remote location between Bridgeport and the Nevada line, 8000 feet up in the Sierras, and through plenty of tough granite rock.

Breakdowns were the principal worry, for this was the biggest job the firm had ever tackled. Two major decisions were made: (1) to use equipment known for dependability, and (2) to service each piece up to factory-approved standards.

A new 1½-yd. Bucyrus-Erie 38-B shovel took over the toughest excavating. Pre-bid estimates were based on 1,000 cubic yards of excavation per 8-hour shift for this machine. Weeks went by and the 38-B worked a full shift daily with no lost time, handled boulders up to 72 inches in diameter, and dug rock so well that blasting was negligible. Final yardage figures for the long-haul phase of the job showed the 38-B averaged up to 1,200 cubic yards per shift — 20% better than the pre-bid estimate.

This same 38-B, equipped with dragshovel front end, just completed another difficult job for its owner, I. L. Croft & Son, Inc. of Saugus, California. This one was the construction of an aqueduct for the City of San Diego and, once again, Bucyrus-Erie dependability and big-output performance helped the owner finish the job on time, and at a profit.

That same kind of performance is ready to go to work for you — in excavators from ⅜ to 4-yd. sizes. See your Bucyrus-Erie distributor soon for complete information.

99E55C

Here the new highway hugs the bank of the East Walker River, 6,000 ft. up in the Sierras.

BUCYRUS ERIE

South Milwaukee Wisconsin

1880 75 1955

YEARS OF SERVICE to Men Who Shape the Earth

TAKE TIME OUT

Cancer strikes 1 in every 4 Americans. It strikes with vicious swiftness. Too often it is discovered — too late.

To protect yourself and your family, have a thorough medical examination every single year without fail. Six months after such an examination, every woman over 35 should return for a pelvic checkup. Every man over 45 should have a chest X-ray twice each year. *Many cancers can be conquered if caught in time!*

STRIKE BACK AT CANCER... MAN'S CRUELEST ENEMY

Give to
AMERICAN CANCER SOCIETY

BUSINESS AND FINANCE

Business Briefs . . .

• **Construction employment** rose 153,000 between March and April, according to the Department of Labor. That's an unusually large gain for this time of year. It brings total employment in the industry to 2,400,000, about 35,000 under April employment last year and about 90,000 below the record employment for the month in 1953.

• **Cement expansion**—Ideal Cement Co., of Denver, plans to boost capacity from 21,500,000 bbl a year to 31,000,000 bbl by spending $55 million. Plants would be expanded at Houston, at Ada, Okla., Trident, Mont., and Superior, Neb.

• **Ford expansion at Livonia**—Ford Motor Co. plans to build a 580,000 sq ft addition to its automatic transmission plant at Livonia, Mich.

• **American Enka Corp.** plans a rayon staple fiber unit costing $20 million at its Lowlands, Tenn., plant.

• **New York Thruway** revenue for April was up 36% over March, according to the Thruway Authority. Total revenue was about $820,000. Passenger vehicle revenue was $557,000—a gain of 65%. Revenue from commercial vehicles totaled $263,000, for a gain of 0.8%.

• **National Cement Co.**, a new enterprise, will build its first plant near Ivanpah, Calif., at a cost of $6.5 million. Capacity will be about 1,000,000 bbl a year. A second plant will be started in southern California when the Ivanpah unit is completed, around July 1956.

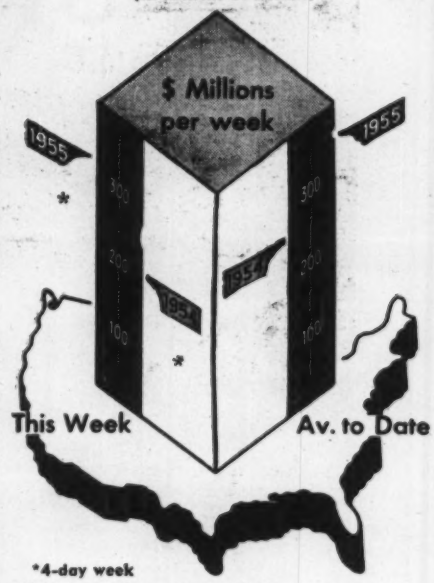
• **$10-million shopping center** is planned just north of San Antonio, Texas, by National Department Stores, of New York.

• **New York City Transit Authority** plans to spend $650 million through 1960, mostly for construction.

• **Merritt-Chapman & Scott** net earnings for the first quarter of this year are up 142% over the same 1954 period, according to MC&S president Louis E. Wolfson. Earnings of Devoe & Raynolds Co., New York Shipbuilding Corp., and Tennessee Products & Chemical Corp. are included since early March. The company has a backlog of about $120 million in construction work, as compared with $81 million a year ago.

Activity This Week

As reported to ENR
(In millions of dollars)



*4-day week

Amount of contracts let

	This Week*	Cumulative 22 wks 1955	1954	% chge
Federal	$27.9	$733.6	$443.3	+65
State and Municipal	79.7	2,116.9	1,865.1	+14
Total public	107.6	2,850.5	2,308.4	+23
Total private	216.5	5,016.2	3,238.9	+55
U. S. Total	$324.1	$7,866.7	$5,547.3	+42
Contracts by type of work				
Waterworks	$1.9	$105.4	$98.8	+7
Sewerage	7.9	166.9	154.7	+8
Bridges	6.8	188.8	152.5	+24
Highways	45.2	838.1	682.2	+23
Earthwork, Waterways	9.2	15.3	114.4	+88
Buildings: Public, excl. hsg.	19.5	684.5	686.4	−0.3
Housg., public	6.9	121.1	85.2	+42
Housg., private	169.1	2,961.4	1,782.6	+66
Commercial	22.7	677.7	514.8	+32
Industrial	21.9	1,055.8	815.1	+30
Unclassified	13.0	851.7	460.6	+85
Total	$324.1	$7,866.7	$5,547.3	+42

* 4-day week

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

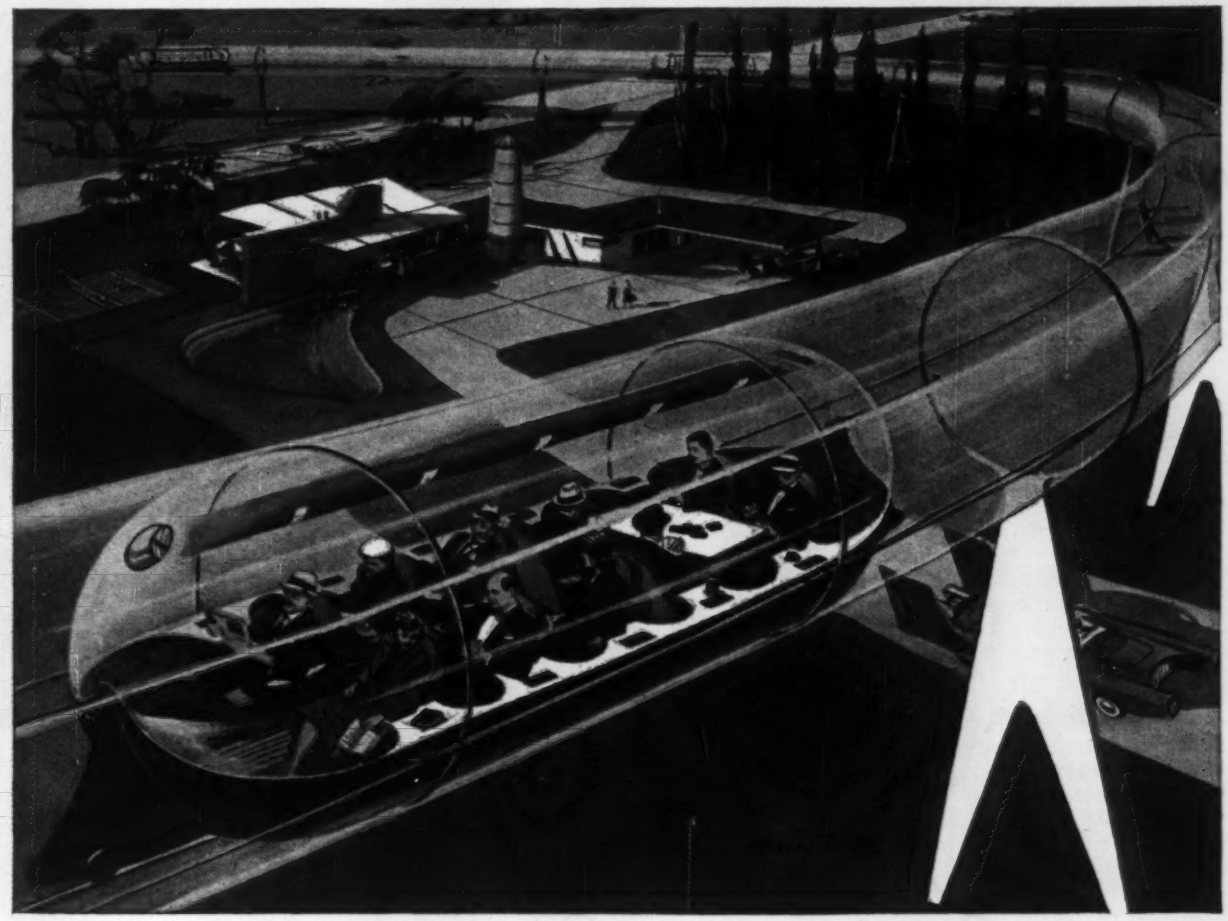
(millions of dollars)

	Week of May 26 1955	Cumulative 21 wks 1955	% chge '54-'55
Corporate securities	$81.9	$1,392.9	+13
State and municipal: All except housing	74.8	1,619.7	−30
Housing	...	46.2	+8
Federal loans	1.2	40.2	−20
Federal aid	...	95.0	+73
Total non-federal	$157.8	$3,194.0	−14
Federal appropriations: In U. S.	...	$59.2	+6
Outside U. S.	...	...	−100
Total new capital	$157.8	...	−13

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction Cost	5/26	654.02	314.39	137.11
	4/28†	653.26	314.02	136.95
Building Cost	5/26	463.66	250.64	131.80
	4/28	462.55	260.04	131.48
Volume	Apr.	609	248	176
	May	691	281	200

† Official monthly index for May



"TRAVEL CAPSULES" . . . air-conditioned, plastic-enclosed, propelled at high speeds along elevated tubeways . . . immune to weather, traffic delay, mechanical breakdown. Science is exploring its possibilities now.

100 years from now...

WE MAY TRAVEL BY VACUUM TUBE!

Many fantastic developments...today only dreams and lines on an engineer's blueprint...may become the commonplace of the future.

But in that world to come, one highly useful servant will continue its public service much as it does today. Cast iron pipe laid today will still carry our gas and water.

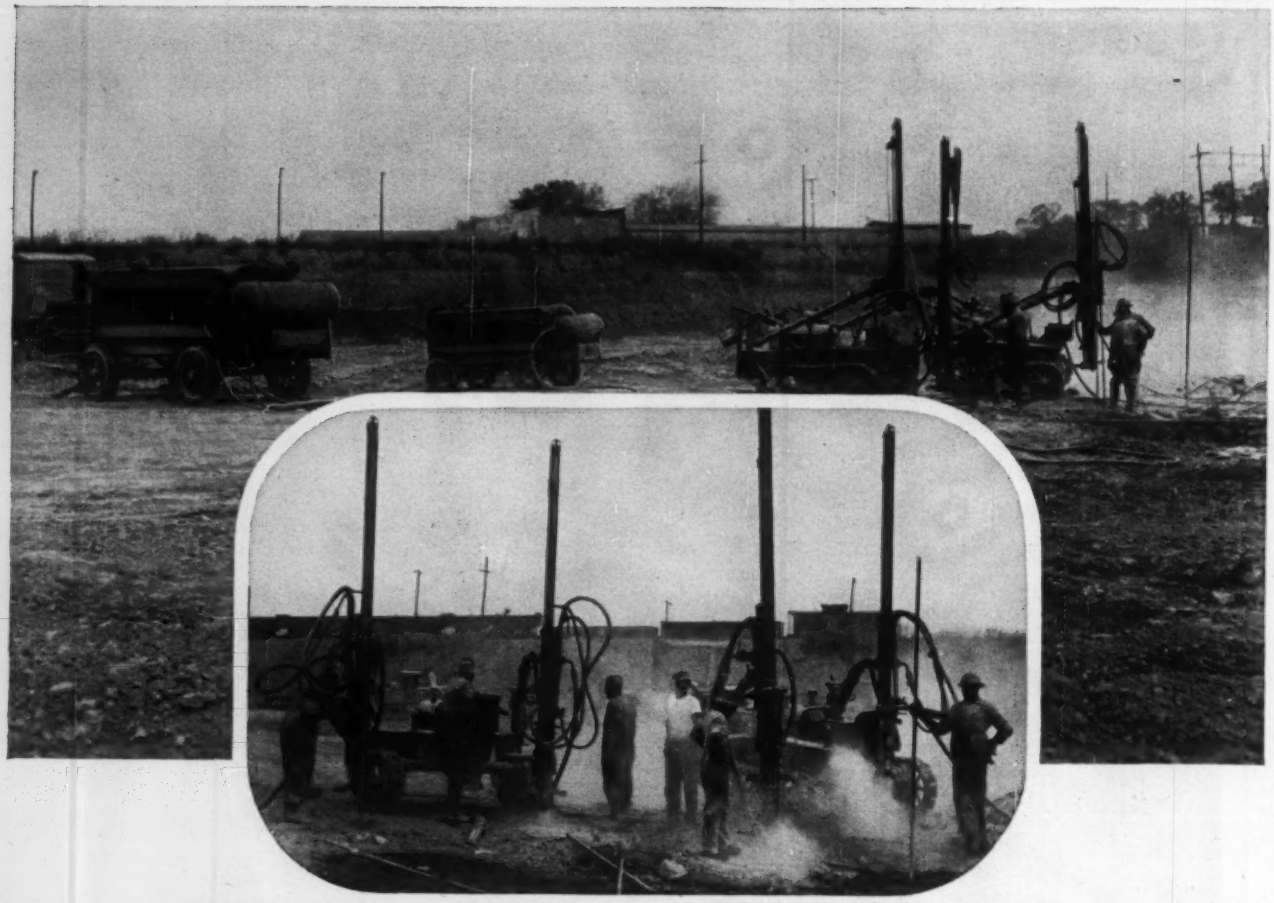
Records show that over sixty American cities are served by cast iron gas and water mains laid in the ground over a hundred years ago! And today, U. S. Pipe, centrifugally cast and quality-controlled, is even more serviceable.

U. S. Pipe is proud to be one of the leaders in a forward-looking industry whose service to the world is measured in centuries.

U.S.
CAST IRON
PIPE
FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE
CAST IRON

U. S. PIPE AND FOUNDRY COMPANY, General Office: Birmingham, Alabama

A WHOLLY INTEGRATED PRODUCER FROM MINES AND BLAST FURNACES TO FINISHED PIPE.



High Speed Sewage Disposal Team

Le Roi Compressors and Cleveland T-286 Mobile Drill Rigs provide flying start for Alabama project

Ordinarily you wouldn't think that air compressors and rock drills had anything to do with sewage disposal plants.

But this plant had its origin in solid bed rock — and the contractor on the job used Le Roi portables and Cleveland Mobile Drill Rigs to solve the situation.

The portables were Le Roi 600's. They were selected for their dependability and economy — which they proved by supplying 600 cfm of air — day in and day out.

The Cleveland T-286 Mobile Drill Rigs further cut costs. Basically the T-286 rig consists of a 25-hp tractor with two Cleveland patented air feeds, 4" drifters, and air-motor booms mounted on a specially-constructed front-end base. The booms swing in a 220 degree arc so that you can get any hole pattern you want. Because the T-286 gives you faster set-ups, better hole spacing, greater footage, faster drilling, greater mobility—because you can drive it anywhere and get better fragmentation — you get lower costs.

You get the whole story on Le Roi Portables and Cleveland T-286 Drill Rigs from our literature. Just write for your copies.

C-158

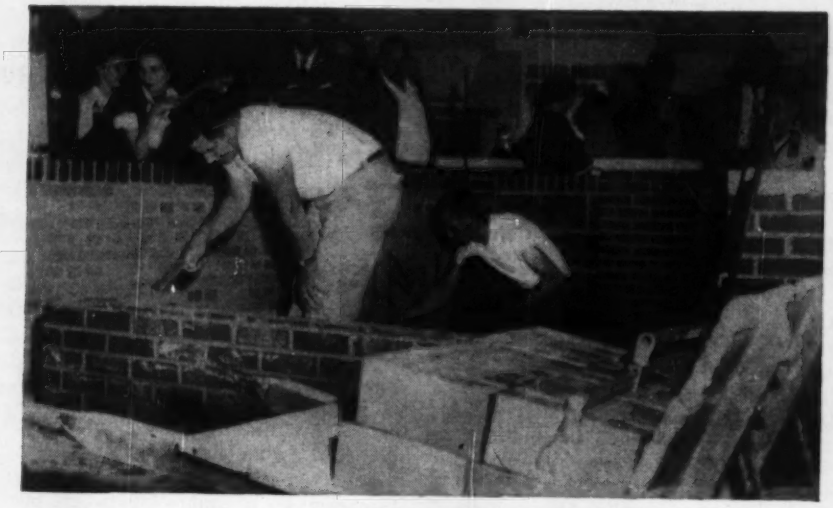
LE ROI *Division of Westinghouse Air Brake Co.*

Milwaukee 14, Wisconsin

PORTABLE AIR COMPRESSORS • TRACTAIR • STATIONARY AIR COMPRESSORS • ENGINES • AIR TOOLS • TRUCK MIXERS • FRONT-END LOADERS

NATION-WIDE SALES-SERVICE NETWORK

ALABAMA: Birmingham, Mobile—ARIZONA: Phoenix—ARKANSAS: Little Rock—CALIFORNIA: Bakersfield, Long Beach, Los Angeles, San Francisco—COLORADO: Denver, Grand Junction—CONNECTICUT: Hartford—FLORIDA: Jacksonville, Miami, Tampa — GEORGIA: Augusta, Decatur — IDAHO: Boise, Idaho Falls, Twin Falls—ILLINOIS: Chicago—INDIANA: Indianapolis—IOWA: Cedar Rapids, Des Moines, Waterloo — KANSAS: Great Bend, Kansas City, Pratt, Wichita — KENTUCKY: Lexington, Louisville — LOUISIANA: New Orleans, Shreveport—MAINE: Augusta—MARYLAND: Baltimore, Hyattsville—MASSACHUSETTS: Hyde Park, Newton Highlands, Worcester — MICHIGAN: Detroit, Grand Rapids—MINNESOTA: Duluth, Minneapolis—MISSISSIPPI: Jackson—MISSOURI: Joplin, St. Louis—MONTANA: Billings, Great Falls, Kalispell, Missoula—NEBRASKA: Omaha—NEW HAMPSHIRE: Manchester—NEW JERSEY: Cranford, Kingston—NEW MEXICO: Albuquerque—NEW YORK: Albany, Binghamton, Buffalo, Long Island City, Newburgh, Rochester, Saugerties, Syracuse, Whitesboro, Woodside (L.I.)—NORTH CAROLINA: Charlotte—OHIO: Cincinnati, Cleveland, Columbus, Dayton, Toledo—OKLAHOMA: Oklahoma City, Tulsa—OREGON: Portland—PENNSYLVANIA: Bethlehem, Harrisburg, Philadelphia, Pittsburgh—RHODE ISLAND: Providence—SOUTH CAROLINA: Columbia—SOUTH DAKOTA: Rapid City, Sioux Falls—TENNESSEE: Chattanooga, Knoxville, Memphis, Nashville—TEXAS: Dallas, El Paso, Houston, Lubbock, San Antonio—UTAH: Salt Lake City—VIRGINIA: Richmond, Roanoke—WASHINGTON: Seattle, Spokane—WEST VIRGINIA: Clarksburg, South Charleston—WISCONSIN: Milwaukee — WYOMING: Casper.



Last Lap for Young Bricklayers...

...Ends With Honors for Four

At the Union Industries Show held in Buffalo, N. Y. last week, 25-year-old William R. Mikulik of Philadelphia, Pa., was crowned champion bricklayer apprentice for 1955.

Competing against 40 other champions from 20 states in the only contest of its kind, he scored the highest in the Seventh Annual National Brickmason Apprentice Competition, sponsored by the Bricklayers, Masons and Plasterers International Union (AFL).

The annual contest is actively supported by the Mason Contractors Association of America and the Structural Clay Products Institute, national association of brick and tile manufacturers. It is designed to emphasize the importance of the industry's apprenticeship training program through which 40,000 new bricklayers have been added to the nation's labor force since the end of World War II. According to Harry C. Bates, BM&PIU president, it reflects the union's efforts "to keep the current labor market supplied with the highly skilled craftsmen needed in today's unprecedented construction activity."

Runners-up in the contest were Jerry Huebner, Westlake, Ohio; Gerald Daman, Lansing, Michigan; and John Groden, Jr., Cleveland, Ohio. Contestants were judged for their accuracy, neatness and accomplishment in the competitive assignment—construction of a brick wall.

Wage Talks Go On

Strikes end or continue amid new wage demands

While contract talks in the auto industry moved into the critical stage last week, the building trades kept up a good batting average in their own ball parks.

One of the big innings was in St. Louis where new two-year contracts took the 46 strike-bound building material dealers, including 17 ready-mix concrete plants, off the bench. Results: annual 10-cent boosts in basic rates for laborers and 12.5 cents for drivers of open dry-material trucks; a single rate of $2.35 (instead of the old range of $2.18-$2.34) for drivers of mixer equipment, with a 10-cent increase next year; a hike in welfare contributions from $2.00 to $2.25 per week.

Rochester, N. Y., was less successful and some 200 construction projects in a five-county area limped along amid work stoppages precipitated by four of the trades and supported by 9,000 other union workers. Key to the trouble in Rochester are these demands: a 25-cent increase or a 35-hour week with no loss of pay for carpenters (were offered 10 cents); 5 cents more and a one-year contract for glaziers; a 28-cent boost for lathers (were offered 10 cents more plus 3 cents for advertising the trade to increase business). Plumbers and electricians led off a few weeks ago with one-year contracts and a 10-cent boost.

Meanwhile a stalemate was broken in the Indiana limestone belt where millworkers, machinists, hoisting engineers and blacksmiths in the stone mills ended a month-old strike against 24 companies with new three-year contracts, granting sliding-scale wage increases of 4, 6 and 12 cents, depending upon skill.

Elsewhere negotiations moved along amid these developments:

- Carpenters in 11 southern California counties signed two-year contracts granting an 8.5-cent boost effective June 15 with 4 and 10 cents more next Sept. 15 and May 1 (except for Kern County where the existing differential will be eliminated).
- Painters in Los Angeles won 17 and 11-cent increases under a two-year contract which adds another half-cent to the present 8-cent health and welfare contribution.
- Two more unions in Detroit signed one-year contracts, retaining

(Continued on page 164)

. . . Wage Talks

former fringe benefits and granting a 12-cent boost to millwrights (to $3.22) and a 13-cent increase to asbestos workers (to $3.43).

• In western Pennsylvania, 20,000 heavy construction workers in 33 counties were covered by two-year contracts with the Constructors Assn., granting wage increases of 5 to 10 cents (depending on the area) and permitting work at straight time when less than 40 hours are worked in a week because of bad weather (except in Allegheny County where the issue's up for a union vote).

Somewhat off the beaten path were two short-term contracts and another with a more complex wage formula. Operating engineers on heavy and highway construction in Arizona got a 5-cent increase, effective July 1, under a contract expiring Feb. 29, 1956 in order to get away from negotiations during the peak construction period.

Bricklayers in Spokane won 5 cents now (to $3.37) and 3 cents more Aug. 1 under a contract expiring Jan. 1. And teamsters in a Buffalo, N. Y. local signed a new contract, relating wages to the cost-of-living index and to pay scales for similar work in other cities. The formula is expected to yield an increase of 2% to 3%.

Building Trades See Need For More Vigorous Action

Organized labor in New Jersey is stepping up its efforts to extend the use of union labor in the construction industry.

At its 51st Annual Convention, the New Jersey State Building & Construction Trades Council took a look at a number of spots, both weak and sore, and decided the time has come for vigorous action.

• **Union labor**—One of the big problems is maintenance of union labor on construction projects. The council contends that sometimes contractors will start up a project using union labor with the understanding work will be performed under union conditions. But after the original trades have done their work, the project will be completed with nonunion help.

To combat such practices, the council unanimously adopted a resolution urging local unions and district councils to adhere to "the basic policy that no work shall be performed on any job until and unless all trades to be required on the job have received satisfactory assurance that such work will be performed under union conditions."

• **Small homes**—Noting that union organization in the homebuilding field has lagged behind during the war and postwar construction boom, while the field itself has experienced a big expansion, the convention recognized the necessity of increased activity in the current organization campaign. It voted to lend its full support to council president Sal Maso in his efforts to make the homebuilding drive successful.

• **Other targets**—Other targets listed for attack included the bidding on rural school projects by nonunion contractors, competition from District 50 which is considered a potential source of danger in the state, and lack of uniformity in holidays recognized by the various trades. Recommended legal holidays: New Year's, Washington's Birthday, Decoration Day, July 4th, Labor Day, Election Day, Armistice Day, Thanksgiving, Christmas.

Area Bargaining Extended In the Plumbing Industry

Marking another successful effort in the extension of area bargaining, members of the plumbing industry in metropolitan New York have agreed to negotiate a uniform, area-wide labor contract covering 75 of the area's largest plumbing contractors and 8,000 plumbers in five AFL local unions.

The new agreement will embrace the five boroughs of New York City, and the counties of Nassau and Suffolk on Long Island, formerly covered by a series of separate contracts. Both labor and management feel that the new procedure will eliminate differentials in wage rates, fringe benefits and working conditions and will materially contribute to stabilization of the plumbing industry in building construction.

On national level, Martin P. Durkin, president of the plumbers union, and John F. Regan, general organizer, endorsed the plan. They predicted that steadier and fuller employment for plumbers will flow from the new agreement which will enable contractors to plan their work schedules with greater certainty as to labor costs.

Regan said the union favors unification of labor agreements, "when the economic conditions in a certain area are on an equitable basis." "Uniformity in collective bargaining agreements," he added, "has a stabilizing effect on an industry with a resultant benefit to the builder, the home owner, private industry and the community as a whole."

Existing contracts with the participating unions expire June 30 and negotiations are now under way with the newly formed area bargaining unit known as the Plumbing Contractors Association of the City of New York, Long Island and Westchester County, Inc.

Closed Shop Agreement Gets Union in Trouble

Labor contracts which require union membership as a condition of employment have come under attack again—this time in Philadelphia. The National Labor Relations Board has branded as illegal the union security provisions in a contract between the plumbers union and the Air Conditioning, Heating and Plumbing Employers Association.

Under the provisions which were questioned, the contractors agreed to hire only union men in good standing with Local 420. The union's job was to meet the contractors' needs by referring individuals for employment. Effect of the provisions, the board said, was to establish a closed shop or to set up a system of preferential hiring, constituting an unfair labor practice under the Taft-Hartley Act.

The situation came to a head when some nonunion men applied to one of the contractors for work. The contractor referred them to the union which charged them $10 a week for work permits and referred them back to the contractor. The men worked several months. Their permits were then revoked and they were laid off.

In winding up the dispute, the board put an end to the hiring provisions and ordered the union to reimburse the men for loss of pay and amounts they'd paid for work permits.

Labor Briefs . . .

• **More education**—The AFL of Massachusetts has established a series of scholarships, ranging from $100 to $1,500. Two for $1,500 each are available to members of its affiliates for 13-week courses at Harvard, the rest are open to high school students.

• **An international steps in**—The affairs of AFL's Asbestos Workers Local No. 1 in St. Louis, Mo., have been taken over by the international union. Robert E. Mitchell, business agent, has been put in charge with instructions to reorganize administration of the local.

Converter ends engine stalling on the job

Eimco Corporation reports it's impossible to stall the Eimco 105 tractor engine through its Allison TORQMATIC Converter.

That means the crawler delivers its full 45,000-pound drawbar pull even at a standstill—means it can handle bigger loads than other tractors of equal power not equipped with a torque converter.

But greater working ability is just one of the many operating advantages the TORQMATIC Converter, in combination with Eimco's transmission, brings to this new crawler. It eliminates the master clutch and clutch pedals, permits instant reversing at all speeds.

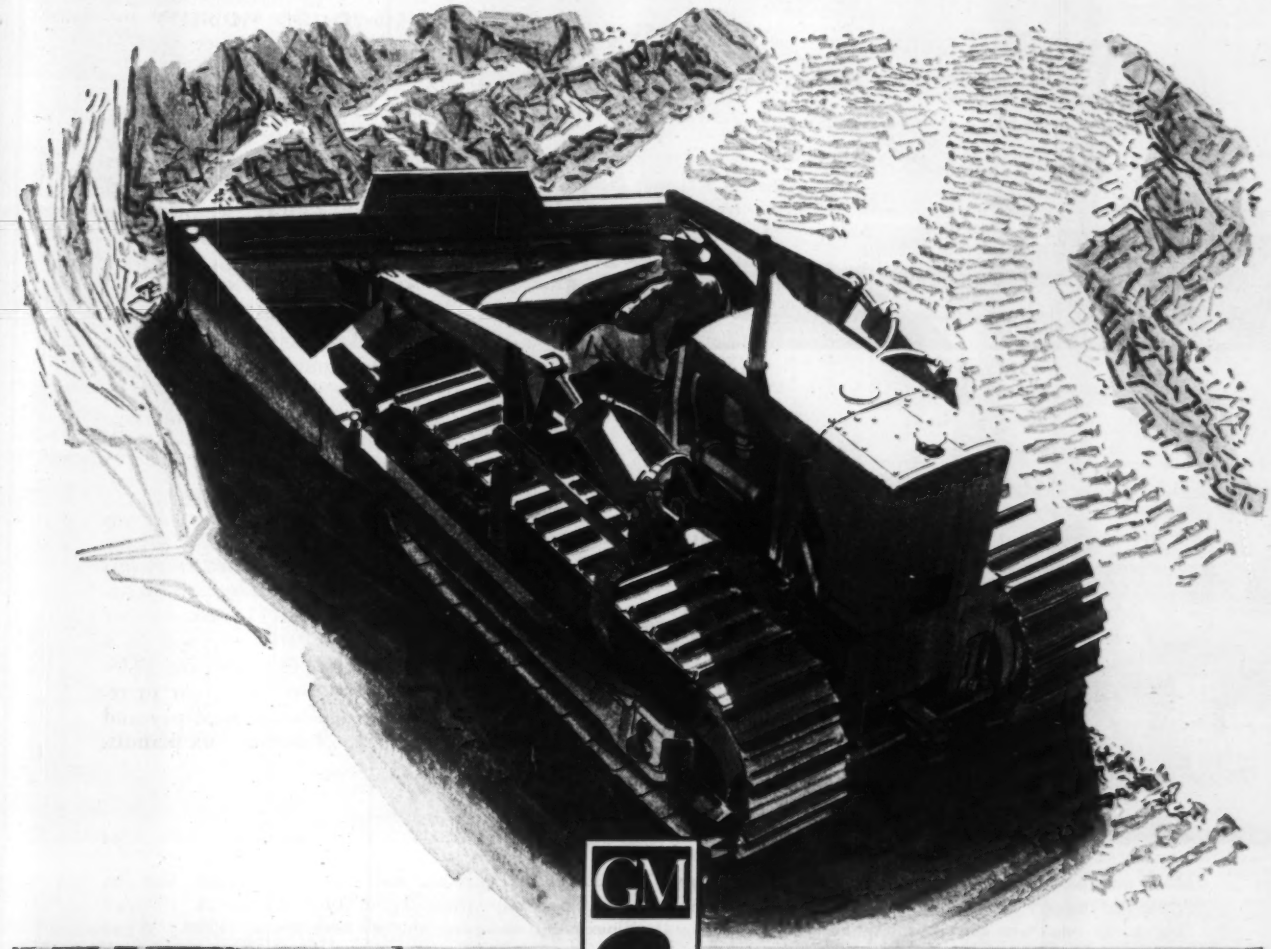
It reduces operating costs by continually matching tractor speed to the load, multiplying engine torque output, holding the power to the load at all times.

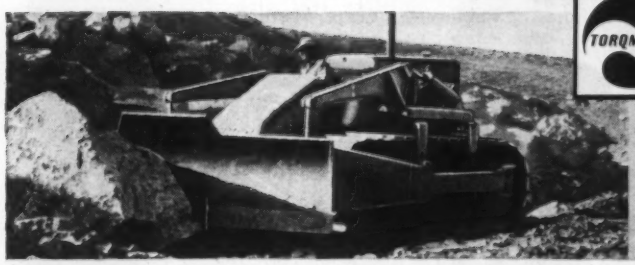
It increases the life of gears, bearings, shafts and engine by transmitting power smoothly, protecting engine and driveline components from harmful shock loads, preventing engine lugging or stalling.

And it gives the Eimco 105 an infinite number of speeds within its operating range with only four control-lever positions—two forward and two reverse.

The Eimco Corporation describes the Allison TORQMATIC as the "finest fluid converter." It's a key component in a tractor that cost over $5,000,000 to develop.

You'll find Allison TORQMATIC Converters and TORQMATIC Transmissions used in a wide range of heavy-duty equipment made by many leading manufacturers. TORQMATIC Converters fit gasoline or Diesel engines from 40 to 400 horsepower. TORQMATIC Transmissions can handle up to 300 horsepower. Ask your equipment dealer or manufacturer about Allison TORQMATIC DRIVES next time you buy—or get more information by writing Allison Division of General Motors, Box 894E, Indianapolis 6, Indiana.



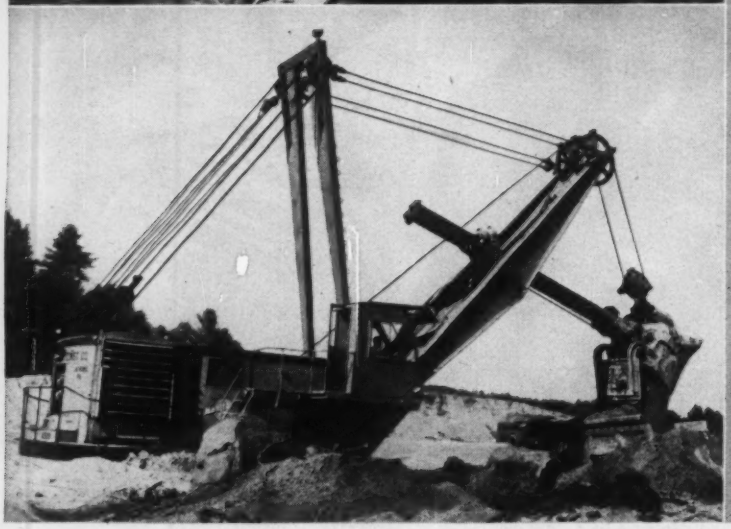


GM TORQMATIC

Allison
TORQMATIC DRIVES

ROAD BUILDING?

Get the jump on competition with this 5½ yard Manitowoc 4500



FAST JOB-TO-JOB MOBILITY
FAST ON-THE-JOB ERECTION

INDIANA TOLL ROAD — Proof of Manitowoc's mobility and fast, economical erection on the job. Western Contracting Corporation of Sioux City, Iowa, unloaded and erected this 4500 in record time "between trains". Total unloading and erecting time was less than four days. Because of its narrow, low travel clearance and design, unit was shipped on a flat car without having to be completely dismantled. This 5 yard dragline with 140 ft. boom was assigned to excavate more than 200,000 yards of material.

BIG DIGGING CAPACITIES
FAST WORKING CYCLES

WEST VIRGINIA TURNPIKE — Latrobe Construction Co.'s 4500 Manitowoc shovel with 5½ yd. bucket moved 550,000 yards of rock in a 4-month period — averaging 6000 yards per eight-hour day, with performance reaching a maximum of 778 yards per hour in "well shot" rock.

More and more successful road building contractors across the country are making the Manitowoc 4500 the "big tool" on their big jobs. When you have big yardage to move — move it fast with a giant Manitowoc 4500. Only the "4500" has the perfect combination of big machine capacity and the mobility and fast, simple portability of small machines. It can be easily trailored from job-to-job or transported by flat car. On the job it can be erected in a matter of several days and is easily maneuvered from one location to another without trailing a cable. Handles big rock without picking or scratching. With one 4500 instead of several small machines, you cut down on the number of operators and oilers on the job. Get the edge on competition — give yourself a "break" on your next bid — figure on a Manitowoc 4500. Write Manitowoc Engineering Corp., Manitowoc, Wisconsin.

MANITOWOC

SHOVELS 1-5 YD. Speedcrane CRANES 20-100 TON

OFFICIAL PROPOSALS

Bids: July 6, 1955

Contract 288

CONSTRUCTION OF HOGBACK DAM

SEALED PROPOSALS addressed to The Board of Contract and Supply of The Metropolitan District and endorsed "CONTRACT 288 — PROPOSAL FOR CONSTRUCTION OF HOGBACK DAM IN THE TOWNS OF HARTLAND AND COLEBROOK, CONNECTICUT," will be received at the Executive Offices of The Metropolitan District, 115 Broad Street, Hartford, Connecticut, until 9:30 A. M., Eastern Daylight Saving Time, Wednesday, July 6, 1955, at which time and place they will be publicly opened and read.

The work consists of the construction of an earth and rock fill dam about 800 feet long and 135 feet high with concrete diversion conduit, concrete spillway weir and rock channel, gate house, tunnel heading, 2 miles of road and other appurtenant structures. The dam site is located in Hartland on the West Branch of Farmington River about 2 miles north of Riverton and about 6 miles north of Winsted.

Approximate quantities for the principal items:

Earth excavation	185,000 cu. yd.
Rock excavation	440,000 cu. yd.
Concrete masonry	26,000 cu. yd.
Earth, gravel and rock fills	670,000 cu. yd.
Granite masonry	31,000 cu. ft.
Reinforcing steel	525 tons

Plans and specifications may be obtained on and after June 7, 1955, at the Office of the Deputy Manager and Chief Engineer of The Water Bureau of The Metropolitan District, 115 Broad Street, Hartford, Connecticut, on deposit of fifty dollars ($50), in cash or certified or cashier's check, made payable to the Water Bureau of The Metropolitan District, twenty-five dollars ($25) of which will be refunded if both the plans and specifications are returned in good order within one month of date of opening of bids. The full amount of fifty dollars ($50) will be returned to those who submit the proposal and specifications as a bid and return the plans in good order within one month of date of opening of bids. No deposits will be refunded after that time.

Each proposal must be accompanied by a certified check for an amount covering not less than ten per cent. (10%) of the total amount bid, made payable to The Metropolitan District, or a bid bond in like amount. Satisfactory performance and payment bonds, as stated in the Information for Bidders, each for the total amount bid, will be required of the successful bidder.

BOARD OF CONTRACT AND SUPPLY,
By: Richard Dillon, Clerk.
Hartford, Connecticut,
May 24, 1955.

Bids: June 14, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 46 (1953), SECTION 7

Footbridge near Keasler Avenue, Borough of Lodi and Footbridge near Bank Street, Borough of East Paterson, Bergen County. The principal items of construction are:

Estimated:

- 145 cu. yds. Concrete in Structures
- 5,830 lbs. Reinforcement Steel in Structures
- 87,280 lbs. Structural Steel
- 8 M.B.M. Treated Timber
- 641 lin. ft. 6 foot Woven Wire Fence
- 205 lin. ft. Pipe Railing
- 250 sq. yds. Macadam Pavement

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. on Tuesday, June 14, 1955, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of Nw Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000; (2) a proposal bond for a sum of not less than fifty (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 3 of the Prequalification Questionnaire); and (5) a Non-collusion Affidavit; and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: June 22, 1955

Indiana Toll Road Commission
309 W. Washington Street
Old Trails Building
Indianapolis, Indiana

NOTICE TO BIDDERS
Contract No. C-10/10A

Sealed proposals will be received by the Indiana Toll Road Commission at or before 10:00 A.M., Central Standard Time, June 22, 1955, for the performance of the contract enumerated above.

The grading, drainage, structures and paving of approximately 2.5 miles in Construction Section C-10/10A of the Indiana East-West Toll Road beginning at a point about 1,365 feet east of the centerline of Virginia Street at Toll Road Centerline Station 1009+89 and extending east and south to a point about 3,445 feet east of the centerline of 15th Avenue at Toll Road Centerline Station 1140+44, all in the City of Gary, Lake County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation	389,000 cu. yds.
Peat Excavation	248,000 cu. yds.
Borrow	1,197,000 cu. yds.
Structure Approach Embankment	353,000 cu. yds.
Special Fill for Peat Deposits	285,000 cu. yds.
10" Reinforced Concrete Pavement	143,000 sq. yds.
Hot Asphaltic Surface Course	3,650 Tons
Culvert Pipes and Underdrains	15,600 lin. ft.
Concrete for Structures	14,000 cu. yds.
Reinforcing Steel	2,200,000 lbs.
Fabricated Structural Steel	5,900,000 lbs.
Metal Handrail	7,300 lin. ft.
Steel Piling	26,200 lin. ft.

Copies of the Plans, Specifications and Proposal Forms for said Contract are available for public inspection or purchase at the office of the Chief Engineer, Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for the Indiana East-West Toll Road	$ 5.00
Plans, Special Provisions and Proposal Forms, per set, for Contract C-10/10A	$25.00
Informational Drawings	
Cross Sections, per set, for Contract C-10/10A	$25.00
Soil Plan and Profiles, per set, for Contract C-10/10A	$ 5.00

NOTICE TO BIDDERS

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Contractor's statement for qualification on the forms supplied by the Commission will be required from all Bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5%) per cent of the total price bid for the Contract. The Proposal Guaranty shall be in the form of an acceptable surety bond or a certified check on a solvent bank.

If the Bidder is an out of state corporation, he shall be required to furnish a certificate from the Secretary of State of Indiana as evidence that the corporation has complied with the Indiana Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Indiana.

All bids must be received at or before 10:00 A.M., Central Standard Time, June 22, 1955, in the offices of the Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. At said hour, the bid box will be publicly opened and the bids read.

The award of the above contract, if any award be made, will be to the Bidder or Bidders whose Proposal is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

INDIANA TOLL ROAD COMMISSION
Dr. Dillon Geiger
Chairman

Charles W. Keating
Secretary-Treasurer

Bids: July 12, 1955

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR ELECTRICAL WORK AT
LONG SAULT DAM
NEAR MASSENA,
ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATION NO. PA-5-14031
ST. LAWRENCE CONTRACT NO. 18

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the electrical work at Long Sault Dam near Massena, St. Lawrence County, New York in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A.M. Eastern Daylight Saving Time on the 12th day of July, 1955, 270 Broadway, Hearing Room C on the 6th floor, New York, New York.

(2) If mailed in, until 10:15 A.M. Eastern Daylight Saving Time on the 12th day of July, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The principal items of work are:

(a) The installation of the following Authority-furnished equipment consisting of load and control centers, diesel generator, gate guide heaters, communication system, lighting transformers and all wire and cable.

(b) The furnishing and installing of the exposed conduit and grounding systems, lighting system, power cabinets and crane conductor system.

(c) The installation of electrical equipment for items of a basically non-electrical nature; such as: fixed gate hoists, compressors, pumps, water treatment equipment, heaters, fans and other miscellaneous equipment.

The work shall be completed on or before December 1, 1958.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto, 2, Ontario, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Twenty-five ($25.00) dollars per initial set and Ten ($10.00) dollars per set for additional sets, no part of which will be refunded.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Each proposal must be accompanied by a draft or certified check payable to the order of Power Authority of the State of New York for the sum of $75,000.00.

The right is reserved to reject any or all bids.

W. S. CHAPIN
5/25/55 GENERAL MANAGER

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: June 16, 1955

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 16th day of June 1955, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Herkimer, Madison, Montgomery and One da	M.T. 55-7	New York State Thruway–Mohawk Section–Subs. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10A, 10B, 11A, 12A, 12B, 12C, 12D, 13A, 14, 15 and 16	....	Furnish and Install 48,000 L.F. Cable Guide Railing. 123,000 L.F. Beam Type Guide Railing	$28,000 Plans $10	$513,000
Montgomery	M.T. 55-8	New York State Thruway–Mohawk Section–Subs. 12D, 13A and 14	....	Furnish and Install 4,000 L.F. Chain Link Fence	$900 Plans $10	17,000
DISTRICT No. 5, C. R. WATERS, District Engineer, 65 Court St., Buffalo, N. Y.						
Erie	R.C. 55-10	Broadway–Depew, S.H. 914	3.18	Asp. Conc., Ty. 2A = 3.17 Mile Misc. Work = 0.01 Mi.	$11,000 Plans $10	208,000
DISTRICT No 6, J. H. THOMAS, District Engineer, State Office Building, Hornell, N. Y.						
Allegany	FARC 55-36	Friendship–Bolivar, Pt. 2, S.H. 1246 Genesee–Portville, S.H. 1322 Proj. F-421(7)	3.81	Asp. Conc., Opt.	$27,000 Plans $10	490,000
DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Rockland	H.T. 55-5	New York State Thruway Hudson–Section, Sub. 8 (Hungry Hollow Rd.)	0.24	Asp. Conc., Opt. Hy. Sep. Comp. I-Beam 190.9'	$12,000 Plans $15	215,000
Westchester	R.C. 55-15	Port Chester Village: Main Street, S.H. 5662	1.22	Asp. Concrete Opt.	$6,000 Plans $10	$103,000
DISTRICT No. 1, N. F. RONAN, Acting District Engineer, 353 Broadway, Albany, N. Y.						
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 No. Genesee St., Utica, N. Y.						
DISTRICT No. 3, WM. ROBINSON, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
DISTRICT No. 4, E. G. H. YOUNGMANN, District Engineer, Barge Canal Terminal, Rochester, N. Y.						
DISTRICT No. 5, C. R. WATERS, District Engineer, 65 Court St., Buffalo, N. Y.						
DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Albany, Greene, Schenectady, Herkimer, Madison, Montgomery, Oneida, Cayuga, Seneca, Onondaga, Genesee, Monroe, Ontario, Erie, Orange and Ulster	T.T.S. 55-3	New York State Thruway–Catskill, Mohawk and Ontario Sections		Furnish and Erect Service Area Traffic Signs and Delineators	$8,000 Plans $10	151,000

NOTE: Plans and proposals for contract No. T.T.S. 55-3 will be distributed only by our Albany and New York City offices but will be exhibited for examination in our Districts 1, 2, 3, 4, 5 and 8 offices where work is located.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Read the Official Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

OFFICIAL PROPOSALS

Bids: June 14, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

WHEAT ROAD, S-195 (1)

Construction of Wheat Road from Cumberland County Line to U.S. Route 40 Borough of Buena and Township of Buena Vista, Atlantic County, Federal Aid Secondary Project No. S-195 (1). Length 3.087 Miles. The principal items of construction are:

Estimated:

4,748 cu. yds. Excavation
11,700 cu. yds. Road Gravel
48,445 sq. yds. Preparation of Subgrade
5,460 tons Bituminous Concrete FA-BC-1
3,072 lin. ft. Drainage

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, June 14, 1955, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P.L. 769, 81st Congress, and is to be performed in accordance with the "Required Provisions—Federal-Aid Contracts" of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications. The attention of the bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed in this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00; (2) a proposal bond for a sum of not less than fifty percent (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 3 of the Prequalification Questionnaire); and (5) a Non-collusion Affidavit executed in duplicate; and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

READ THE OFFICIAL PROPOSAL COLUMN OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

Bids: June 16, 1955

Massachusetts Turnpike Authority

NOTICE TO CONTRACTORS

Sealed proposals for Highway and Bridge construction for a section of the Massachusetts Turnpike in the City of Chicopee and the Town of Ludlow (CONTRACT NO. 51-193) will be received at the office of the Secretary-Treasurer, Massachusetts Turnpike Authority, Room 1059, 80 Boylston Street, Boston 16, Massachusetts until 10:00 A.M. of Thursday, June 16, 1955, and immediately thereafter will be publicly opened and read in the Surrey Room on the lobby floor of the Hotel Touraine across the street from the Turnpike Authority's offices.

Proposal Guaranty: $110,000.

Charge for plans and proposal forms: $100.00, not refundable.

Charge for printed copy of Standard Specifications: $10.00, not refundable.

Complete information at said office of the Authority: at office of General Consulting Engineer to Authority: Howard, Needles, Tammen & Bergendoff, Room 1146, 80 Boylston Street, Boston 16, Massachusetts, and at office of Section Engineer: Charles A. Maguire & Associates, 14 Court Square, Boston, Massachusetts.

Minimum wage and dump-truck rates have been established. Right reserved to waive an informality in or reject any or all proposals. An award will not be made to a Contractor who is not equipped to promptly undertake and complete the work.

By: WILLIAM F. CALLAHAN, Chairman
May 21, 1955

June 14, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

BRIDGETON-JERICHO ROAD,
SEC. 2=PROJECT S—176(4), &
BRIDGETON-MILLVILLE ROAD
=PROJECT S—204(1)

Construction of Bridgeton-Jericho Road, Section 2, from end of Section 1 to Greenwich Road in Hopewell Township and Bridgeton-Millville Road from Sugarman Avenue to Miller Avenue to Miller Avenue in Deerfield Township, Cumberland County. Federal Aid Secondary Project Nos. S—176 (4) and S—204 (1). Length 2.098 miles. The principal items of construction are:

Estimated:

6,267 cu. yds. Roadway Excavation-Unclassified
12,194 sq. yds. 10" Gravel Shoulders
24,562 sq. yds. 8" Gravel Base Course
3,516 tons Bituminous Concrete, FA—BC—1
1,813 lin. ft. Concrete Curb

Bids for the above will received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, June 14, 1955, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the "Required Provisions=Federal-Aid Contracts" of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plan and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00; (2) a proposal bond for a sum of not less than fifty percent (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 3 of the Prequalification Questionnaire); and (5) a Non-collusion Affidavit executed in duplicate; and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

OFFICIAL PROPOSALS

Bids: July 15, 1955

Sub-Contract for Spillway Control Gates

IRAQ GOVERNMENT—DEVELOPMENT BOARD

DOKAN DAM—CONTRACT NO. 1

1. Acting on behalf of the Government Board of the Government of Iraq, tenders are invited by Group Dumez-Ballot of Bagdad for a subcontract for the supply and installation of these spillway control gates each 10 m. x 6.8 m., stoplogs and associated equipment at Dokan on the Lesser Zab river.
2. Construction of the spillway has already begun and the successful tenderer will be required to enter into a contract with the Main Contractors at an early date, rapid delivery of the equipment being essential.
3. Sub-Contract Documents including the Contract Documents for the Main Civil Engineering Contract and drawings may be inspected at any of the following places, namely:
   a/ The Offices of the Development Board, Bagdad.
   b/ The Iraqi Embassy, London.
   c/ The Iraqi Embassy, Washington.
   d/ The Royal Iraqi Legation, Paris.
   e/ The Royal Iraqi Legation, Brussels.
   f/ The Royal Iraqi Legation, Rome.
   g/ The Head Office of Messrs. Binnie, Deacon & Gourley, (Consulting Engineers), Artillery House, Artillery Row, London, S.W.1
   h/ The Head Office of Societe Dumez, 33, rue Henri Rochefort, Paris 17e, France.
4. Firms desiring to tender may obtain copies of the Sub-Contract Documents and Drawings together with the relative sections of the Contract Documents for the main civil engineering works from Societe Dumez of Paris upon payment of 20 000 Francs.
5. Tenders must be written in English and six copies must be submitted to Group Dumez-Ballot, Bagdad, c/o Societe Dumez in Paris, and will be received up to noon on 15th July 1955.
6. Tenders must be accompanied by full particulars of the tenderer's facilities for undertaking the work and experience of executing work of a similar character and magnitude.

Group Dumez-Ballot, Bagdad
c/o Societe Dumez,
33, rue Henri Rochefort,
Paris 17e—France

OFFICIAL PROPOSALS

Bids: June 28, 1955

Contract NYA-590.002

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CARGO BUILDINGS
NOS. 80, 81, 82, AND 83 AND BUILDING NO. 85

Sealed proposals for the construction of Cargo Buildings Nos. 80, 81, 82, and 83 and Building No. 85 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 28, 1955, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, June 2, 1955

Bids: June 14, 1955

Massachusetts Turnpike Authority

NOTICE TO CONTRACTORS

Sealed proposals for the construction of the concrete deck of the Connecticut River Bridge between the Town of West Springfield and the City of Chicopee, (CONTRACT NO. 51-061) will be received at the office of the Secretary-Treasurer, Massachusetts Turnpike Authority, Room 1059, 80 Boylston Street, Boston 16, Massachusetts until 11:00 A.M. of Tuesday, June 14, 1955, and immediately thereafter will be publicly opened and read in the Surrey Room on the lobby floor of the Hotel Touraine across the street from the Turnpike Authority's offices.

Proposal Guaranty: $12,000.00
Charge for plans and proposal forms: $25.00, not refundable.
Charge for printed copy of Standard Specifications: $10.00, not refundable.

Complete information at said office of the Authority: and at office of General Consulting Engineer to Authority: Howard, Needles, Tammen & Bergendoff, Room 1146, 80 Boylston Street, Boston 16, Massachusetts.

Minimum wage and dump-truck rates have been established. Right reserved to waive any informality in or reject any or all proposals. An award will not be made to a Contractor who is not equipped to promptly undertake and complete the work.

By: WILLIAM F. CALLAHAN, Chairman
May 21, 1955

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4437) will be received at Huron, South Dakota until June 30, 1955, for furnishing labor and materials for Pierre Warehouse, Transmission Division, Missouri River Basin Project, South Dakota. Location in Hughes County, Pierre, South Dakota. Principal items are 1,700 cu. yds. excavation for warehouse site and from borrow; 900 cu. yds. backfill; 900 cu. yds. gravel surfacing; 6,000 pounds placing reinforcement bars; 5,000 pounds furnishing and placing reinforcement bars; 350 bbls. furnishing and handling cement; 250 cu. yds. concrete; constructing warehouse, lump sum; and other work. Completion time 150 days. For particulars, address Bureau of Reclamation, P. O. Box 825, Huron, South Dakota; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: July 5, 1955

City of Richmond, Virginia

NOTICE TO BIDDERS

Sealed Proposals will be received at the office of the City Purchasing Agent, 4th floor, Mosque Building, Laurel and Main Streets, Richmond, Virginia, until but not later than 11 o'clock A.M., E.S.T. July 5, 1955, at which time they will be publicly opened and read aloud, for the following work which may be awarded in whole or in part:

Location: From and including a connection with the river crossing inlet chamber, to be built under another contract, at a location near the City Lock, along the northeast bank of the James River to the outlet of the existing Shockoe Creek System west of 17th Street in the City of Richmond, Virginia.

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division B—Schockoe Creek Intercepting Sewer" and comprises the construction of approximately 3,300 linear feet of 96-inch reinforced concrete pipe sewer complete with all manholes, intercepting and overflow structures, and other structures as shown, specified and directed.

The Proposal must be submitted on the proposal forms included in the Contract Documents.

Each Proposal must be accompanied by a certified or cashier's check made payable to the City of Richmond, equal to 5% of the amount of the Proposal, or bid bond equal to 6% of the amount of the Proposal, or be covered by an annual bid bond in the amount of at least 6% of the Proposal.

The Proposal Guaranty is required as an evidence of good faith and as a guaranty that, if the Proposal of bidder is accepted, the bidder will enter into the formal written Contract and furnish satisfactory Performance Bond. Check will be forfeited or bid bond will become due and payable if the bidder whose Proposal is accepted fails to furnish the required Performance Bond, or fails to execute a formal written Contract. Check of successful bidder will be returned after the Contract is executed.

The Bureau of Purchases reserves the right to waive any informality in bids.

The Contract may be awarded by the Purchasing Agent to the lowest responsible bidder, who shall be determined in the manner provided by law and pursuant to the provisions of the City Charter.

The City may reject any or all bids and may award the Contract in the manner provided by law and pursuant to the provisions of the City Charter.

The unit prices bid will be carefully examined and compared with current values before recommending the award of the Contract. If in the opinion of the Director the unit prices submitted are substantially over or under accepted current values, it will be deemed sufficient reason to recommend the award of the Contract to another responsible bidder. In case of error in the extension of a price in the bid, the unit price shall govern.

Attention is directed to Chapter 7 of Title 54 of the Code of Virginia of 1950. The act requires all contractors and subcontractors bidding on any project where the cost of the undertaking of the bidder is $20,000.00 or more, to register with and obtain a certificate from the State Registration Board for Contractors. Bids from contractors not complying with this law will not be considered. Anyone bidding as a general contractor whose bid includes sub bids amounting separately to $20,000.00 or more is required to obtain evidence from such subcontractors that they have complied with the law.

Any contractor submitting a bid on this project amouting to $20,000.00 or more, must insert the following statement in his bid over his signature: "Registered as a contractor under Chapter 7 of Title 54 of the Code of Virginia of 1950. Certificate No. ....., 19...."

Unless otherwise specified herein, bidders must enclose with their Proposals, in a separate sealed envelope, complete information as to experience, equipment and financial condition on the form provided. Failure to submit this statement will constitute basis for rejection of the bid. Bidders who have previously been awarded contracts for portions of the Sewage Disposal Project will not be required to submit this statement.

The Proposal, Instructions to Bidders, Contract, Performance Bond, Instructions

OFFICIAL PROPOSALS

to the Contractor, Specifications, Plans, and other Contract Documents may be examined at the office of the Director of the Department of Public Works, 217 Governor Street, Richmond, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of the Contract Documents may be obtained from the Director or the Engineers upon deposit of Twenty-five Dollars for each set, to be refunded upon the return of such set in good condition within 10 days after the opening of bids.

It shall be understood that all documents referred to in this Notice to Bidders shall be carefully examined and read and are all hereby made a part of the Proposal.

J. W. HUFFMAN,
City Purchasing Agent

SEARCHLIGHT SECTION

This index is published as a convenience to the reader. Every care is taken to make it accurate but SEARCHLIGHT SECTION assumes no responsibility for errors or omissions.

Aberthaw Co. 176
Agnew, D. R. 175, 176, 177
Air Compressor Rental Co. 175
Albert Pipe Supply Co., Inc. 177
Ambursen Dam Co., Inc. 175
Anderson Equipment Co. 175
Arabian American Oil Co. 172, 173

Bixby Inc., R. W. 171
Boers Equipment Co. Guild 175
Buff 178
B & V Equipment Co., Inc. 175

Civil Service Commission, City of Cincinnati 172
Contractors Machinery Co. 176, 177

Darien Corp. 176
Davis, S. M. 177
Deatherage & Son, G. F. 174
Dick Construction Co. 175
Drachman Steel Corp. 177

Ehrbar, Inc., Edward 175
Electro Metallurgical Co. 174

Ferguson Co. Inc., H. K. 172
Forsythe Equipment Co., Inc. 176
Foster Co., L. B. 176
Frank, M. K. 177

Gannett, Fleming, Corddry & Carpenter Inc. 174
Gillis & Co. 177
Greensburg Machine Co. 175
Greenpoint Iron & Pipe Co. 177

Hartford, City of 173
Hickerson, Roy D. 178

J-P Construction Co., The 175

Kaufman Construction Co. 175

Lockheed Aircraft Corp. 173

Metcalfe, Hamilton, Smith, Beck Cos. 174
Midwest Steel Corp. 177
Mississippi Valley Equipment Co. 176
Montgomery Mfg. Co. 171
Morrison Railway Supply Co. 177
Moseman Construction Co., Inc. 175

National Blue Print Co. 178
National Pile Driving Corp. 175

Pittsburgh Des Moines Co. 174

Rish Equipment Co. 175

Schoonmaker Co., Inc., A. G. 176
Sherman Crane & Service Inc., Roger 177
Smith Inc., L. B. 176
Stone the Crane Man. 175
Sverdrup & Parcel Engineering Corp. 172

Tamblyn System 174

Vilbro Equipment Co., Inc. 177

Warren-Knight Co. 178
Weiss Co., B. M. 175
Welding Engineers Inc. 175
West Virginia Pulp & Paper Co. 172, 173, 174
Williams Construction Co. 175, 176
Wilson Engineering Co. 174

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

(Not available for equipment advertising)

$1.80 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

POSITION WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.80 a line an insertion.

INFORMATION:

BOX NUMBERS count as 1 line additional in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:

The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

EMPLOYMENT ADVERTISING:

New Employment Opportunities Section for Displayed ads starting July issue. For details see announcement ad in this section.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York Office, 330 W. 42nd St., N. Y., for June 16th issue closing June 6th

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Gunite Engineer for estimating and project coordination as assistant to President of Nationally known Gunite Company, Philadelphia area. P-6085, Engineering News-Record.

Estimator, for firm doing extensive sewer, watermain, treatment plant, heavy construction. Must be graduate engineer or have extensive engineering background, with ability to obtain price and job information. Permanent position for qualified applicant. P-6074, Engineering News-Record.

Construction Foreman for firm engaged in extensive sewer, water main and treatment plant facilities. Permanent position in N. Y. State area. Only qualified applicants with broad experience. P-6595, Engineering News-Record.

Concrete Paving Superintendent—Thoroughly experienced in all phases of highway and airport construction, including excavation, drainage, and paving. Must be able to handle complete supervision of concrete paving. Excellent opportunity for qualified man. Western New York Area. P-6514, Engineering News-Record.

Engineer—Married man about 40 years of age. Experienced in water mains, roads and sewer construction. Steady employment 12 months per year with two weeks vacation. Write P-6378, Engineering News-Record.

Civil Engineer, experienced in the design and layout of subdivisions, sewers, water mains and grading. This is a career opening in a consulting engineer's office. Starting salary, $5200.00. State experience, education and give references. Lester V. Johnson Associates, 2309 Wilson Boulevard, Arlington 1, Virginia.

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Fast, easy way to CUT WIRE ROPE
Low cost, portable, safe
For details mail ad to

MONTGOMERY MFG. CO.
24 M Austin St., Newark 5, N. J.

Attention . . .

EMPLOYMENT ADVERTISERS

Effective with the first July issue, a new section will start in ENGINEERING NEWS-RECORD. We will head this section: EMPLOYMENT OPPORTUNITIES. All Displayed Employment Opportunity advertising will be placed in this new section, with the exception of those advertisers who contract for run-of-book position. New advertisers will be billed at the transient rate of $24.25 unless on contract. Contract rates furnished on request. Advertisements are subject to Agency Commission.

POSITIONS VACANT

Wanted Field Engineer, transitman, rodman qualified to stake out highway location cross-section and stake line and grade for structures in New York State. Reply References, education, age and salary required. Reply P-6488, Engineering News-Record.

Foreman-Superintendent—Thoroughly experienced in field supervision in excavation and grading on heavy construction projects. Western New York State. P-6517, Engineering News-Record.

Superintendent-Foreman — Aggressive and thoroughly experienced in blacktop paving, capable of organizing and directing complete projects, including grading, drainage, and paving. Excellent opportunity with a substantial firm. New York State. P-6518, Engineering News-Record.

Construction Estimator experienced in competitive bidding, (quantity take-off, pricing, sub-bids etc.) for all types of building required by established and progressive general contractor in North Western Ohio and Michigan. Engineering degree preferred but not essential. Write stating qualifications, previous employment, availability and references. Salary open, commensurate with experience and ability. Permanent position for qualified applicant. P-6405, Engineering News-Record.

Estimator-Office Engineer—Experience in engineering type construction preferred. Excellent opportunity for profit sharing arrangement for qualified man. Submit complete education, experience background, salary requirement to United Construction Co., Inc. Box 5104—Memphis 12, Tenn.

Chief Draftsman for old established structural fabricating shop in Central Indiana. 20,000 tons per year. Tier and mill building and bridge experience desirable. Write detailed summary of experience and salary expected. P-6556, Engineering News-Record.

Superintendent for southeastern construction firm. Good opportunity with salary and bonus for qualified man. Must have highway bridge, sewage and foundation experience. Submit complete resume, references and required salary. P-6022, Engineering News-Record.

Mechanical Engineer—Experienced M.E. with degree to take complete charge of power plant for large Midwest dairy. Age 27 to 35 with 5 years in power plant; capable of engineering, selecting equipment and maintaining steam, refrigeration, electrical generation equipment and distribution systems. Write complete qualifications in first letter, including references and salary desired. P-6619, Engineering News-Record.

Wanted—Construction Superintendent and foreman, for highways, water mains and sewers. P-6632, Engineering News-Record.

Engineer experienced in structural steel and reinforced concrete design to take responsible charge of work position permanent location city sixty miles from New York. P-6641, Engineering News-Record.

Wanted: Take off man for road construction and drainage work. Age 30 to 45. Send resume to P-6640, Engineering News-Record.

Structural Steel Draftsman and estimator must have minimum of 5-10 yrs. experience in structural steel detailing and estimating. Starting salary $5-7,000. Good future with structural steel fabricating company in Ohio. P-6650, Engineering News-Record.

Assistant Director of Public Works Department: qualifications are, graduate Civil Engineer with some municipal experience. Base salary, $5,600 to $7,000 per year. Applicants should apply to Personnel Officer, City of Boulder, Colo.

SALARIED POSITIONS $5,000 — $35,000

We offer the original personal employment service (established 45 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

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659 Brisbane Bldg. Buffalo 3, N. Y.

POSITIONS VACANT

Engineering Graduate with structural concrete experience for technical and promotional field work in Eastern Pennsylvania. Permanent. Old-established national organization. Reply should include summary of experience and salary requirements. P-6554, Engineering News-Record.

Asst. City Engineer. Must be able to supervise a medium-sized staff of professional and sub-professional engineers in the perparation of plans for street, sanitary, and water installations. Mich. P.E. required. Immediate opening for ambitious man with experience. Salary $7,736 to $8,684 per yr. Submit brochure with request for bulletin and application, Department of Personnel, City Hall, Dearborn, Mich.

Wanted: Asphalt plant superintendent for new high output plant permanently located and now operating in growing southern city. Must know asphalt mixes and have a good mechanical know-how. P-6649, Engineering News-Record.

Planning and Project Engineers—Flood control. Tentative salary July 1, $507 with periodic increases to $616. Preliminary studies and design of flood control construction. Write County Civil Service, 236 Third Street, San Bernardino, California.

Planner. Planning, civil engr., sociology, public adm., geography, or arch. degree plus 3½ years planning exper. required. Salary starts $440. Inquiries: Personnel, P. O. Box 1160, Austin, Texas.

Civil Engineer-Surveyor: Age 30-45, Opportunity!—Profit sharing, established business, fast developing area, subdivision and housing, surveying, office-field. Write P-6657, Engineering News-Record.

EMPLOYMENT SERVICE

Salaried personnel, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

Bridge construction superintendent nine years experience, pile driving, foundation excavation, form and concrete work, 32 years old, sober, will travel U. S., PW-6523, Engineering News-Record.

Construction or Promotion Engineer, 30, B.S.C.E. 8 years experience heavy construction and promotional sales, desires position in Eastern Nebraska. PW-6544, Engineering News-Record.

(Continued on page 174)

Transportation Consultant

Graduate Civil Engineer 28 years railroad experience, completing 5 years foreign service railroad and harbor operations and maintenance, surveys, reports and analysis, available after July 1st. Resume and commendations upon request.

PW-6417, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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A well established engineering construction company has immediate openings available in Cincinnati, Ohio and Cleveland, Ohio office for qualified engineers, group leaders, and designers in one or more of the following catagories:

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INSTRUMENTATION
PACKAGING
TANKS AND VESSELS
BOILERHOUSES
CONVEYORS
HEATING AND VENTILATING
PROCESS EQUIPMENT LAYOUT
LIGHTING LAYOUTS AND CONTROLS
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These positions offer opportunities for long term employment with good salaries, paid vacation and holidays, sick leave allowance, group insurance and hospitalization program, and moving allowance.

If qualified, please submit complete resume stating experience, education, salary requirements and earliest date available to:

The H. K. Ferguson Company

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Washington 6, D. C.

1134 Locust
St. Louis 1, Mo.

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Graduate engineers with minimum 5 years' experience designing, selecting, specifying and/or supervising operations of construction equipment such as crawlers, rubber-tired tractors, shovels, cranes, air compressors, welding machines, pumps, mixers, spreaders, fork lifts, etc.

To consult with manufacturers and suppliers on selection and modification of the above-mentioned equipment. For company's Equipment Engineering Division located in New York City. Salary good; liberal benefits.

Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 57
ARABIAN AMERICAN OIL COMPANY
505 Park Avenue, New York 22, New York

SANITARY ENGINEER

Opportunity available for Sanitary Engineer in an expanding pulp and paper mill located in the Middle Atlantic States. Age 25-35 years. Require man experienced in paper mill wastes, paper mill stream pollution and paper mill water purification. No other experience will be given consideration. Good salary and advancement. All replies confidential. Send resume of educational background and industrial experience to Director of Personnel
West Virginia Pulp & Paper Company
Luke, Maryland

ARCHITECT

Registered; take charge of architectural work in large university; a permanent position with many benefits; salary $5500 a year minimum; apply

Civil Service Commission
260 City Hall
Cincinnati 2, Ohio.

EXPERIENCED HIGHWAY CONSTRUCTION PERSONNEL

Large Nationally known Highway Construction Company, headquartering in Upper Midwest, with operations, branch offices and equipment yards located throughout the country, is looking for experienced engineer-estimator on highway construction. Preferably young man. Must be ambitious and willing to work. Considerable travel required.

Also several Top Grade Superintendents and General Foremen experienced in Highway Grading and/or Paving and Bridge Construction to work under regional or project managers. Good Salaries and future participation pension and Profit Sharing Plans and Stock Ownership for right men.

P-6623, Engineering News-Record, 330 W. 42 St., New York 36, N. Y.

FOREIGN ASSIGNMENTS

Concrete Technician, Chief of Party, and Reinforcing Steel, Grouting, Excavation and Concrete Inspectors wanted for large dam and tunnel project in Iraq. Duration of project approximately five years. Good salary. Provision made for taking family, but no local grade or high school facilities. Send detailed personal history to

P-6616, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

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Immediate Opening on Off-Continent Airbase. Mail Resume showing Dates, Salaries, & Min. Acceptable salary.

P-6601, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

HEATING & VENTILATING ENGINEER

Graduate Engineer experienced in all phases of paper mill heating and ventilating air conditioning and refrigeration for large expanding and progressive mill in Maryland. Under 35 years of age, good salary, all benefits and excellent opportunity for advancement. Send detailed resume of experience and education to
Director of Personnel
West Virginia Pulp & Paper Company
Luke, Maryland

DEPUTY BUILDING INSPECTION SUPERVISOR: Graduation from an accredited four years college with degree in structural or architectural engineering. Seven years of experience in the structural design of buildings and some experience in examination of plans and specifications of building projects and applications for building permits. Salary $5772-$6812 per year.

ARCHITECT I: Graduation from a college or university of recognized standing with a degree in architecture and 2 years experience in architectural planning, design or drafting. Salary $4628-$5460 per year.

Complete details by writing to:

DIRECTOR OF PERSONNEL
Municipal Building, Hartford, Conn.

ENGINEERS
Foreign Service

Graduate Chemical, Mechanical, and Electrical Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of project and process engineering. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30
ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE, NEW YORK 22, N. Y.

MECHANICAL ENGINEER

Graduate Mechanical Engineer experienced in the operation of Fourdrinier paper machines, refining and related equipment for large expanding and progressive mill in Middle Atlantic States. Under 35 years of age. Good salary and excellent opportunity for advancement. Give detailed resume of experience. Send resume to
Director of Personnel
West Virginia Pulp & Paper Company
Luke, Maryland

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These opportunities for engineers in all fields have been created by Lockheed's long-range development program. Projects include: turbo-jet and turbo-prop transports; supersonic fighters far exceeding present-day aircraft in performance; advanced versions of vertical rising aircraft, jet trainers and bombers; nuclear energy applications to aircraft; and a large number of significant classified projects.

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Lockheed Aircraft Corporation
1708 Empire Avenue
Burbank, California

LOCKHEED
Aircraft Corporation
BURBANK, CALIFORNIA

Dear Sir: Please send me your brochure describing life and work at Lockheed in Southern California

My name _____

My present field of engineering _____

My street address _____

My city and state _____

OPPORTUNITIES FOR ENGINEERS

UNION CARBIDE and CARBON Corp.

The General Engineering Department of the Electro Metallurgical Company has the Following Diversified and Interesting Openings for Graduated Engineers and Draftsmen:

PROJECT ENGINEER, to head up a complete project, both the design and construction phases thereof; to supervise overall engineering, material acquisition, cost and construction of project. Top flight engineer with broad experience required.

COST ENGINEER, to prepare construction cost estimates and to control construction expenditures; should be thoroughly familiar with general construction costs throughout the United States. Minimum of five years experience essential.

CONSTRUCTION ENGINEER, under a Project Engineer to follow the construction work of one or more projects and supervise the field work thereof. On major projects would actually supervise field forces and as such would assume the duties of Resident engineer. Top flight engineer, whose major experience has been in large-scale construction.

MECHANICAL ENGINEERS, to supervise the mechanical design of projects of varying magnitude. Responsible for the overall mechanical design work and guidance of capable designers and draftsmen for each project. Minimum of ten years experience essential.

SUPERVISING DESIGN ENGINEERS in the following categories: one each Mechanical, Electrical, Chemical, Civil. Capable men to design or supervise design of major structures, buildings, services, and utilities for varying sized projects. Select machinery and equipment; prepare cost estimates, specifications, requisitions; make bid comparisons for equipment purchases and construction costs. When necessary, supervise erection of buildings and installation of machinery, etc. at job site. Five to ten years experience essential.

SERVICE ENGINEERS—qualified mechanical engineers preferred, with five to ten years experience in trouble-shooting on heavy industry equipment and processes. Must be able to analyze production and/or equipment inadequacies, make constructive recommendations for improvement, and put same into effect.

SENIOR DESIGN ENGINEER-MECHANICAL, with a minimum of five years experience. Able to lay out and design machinery, structures and equipment in heavy industry plants, with special emphasis on materials-handling installations, dust collection, and fluid mechanics. Capable of directing work of Draftsmen, Detailers, and Junior Design Engineers.

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DRAFTSMEN (3—Mechanical, 3—Electrical, 4—Structural) with a minimum of three years experience. Work would involve layout of machinery, buildings, size and arrangement of piping, and electrical wiring diagrams and layouts.

Please send complete resume to:

Electro Metallurgical Company
A Division of Union Carbide and Carbon Corp.
The Personnel Evaluation Office
Niagara Falls, New York

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OVERSEAS
CIVIL
MECHANICAL

Graduate engineer thoroughly experienced in heavy construction operations: good pay, transportation furnished. Apply in person or send resume.

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Experienced in detailing and checking shop drawings of structural steel for buildings and bridges. College education not necessary. Paid holidays, vacation, and other usual benefits. Send complete experience record and salary requirements to:

Pittsburgh-Des Moines Steel Company
1015 Tuttle St. Des Moines, Iowa

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Send complete outline of experience, date available and salary desired in first letter to:

Gannett Fleming Corddry & Carpenter, Inc.
Box 366, Harrisburg, Pa.

EXPERIENCED HYDRAULICS ENGINEER WANTED

Graduate engineer experienced in paper mill hydraulics, planning and development of piping layout systems, etc. for large expanding and progressive mill in Maryland. Good salary, all benefits and excellent opportunity for advancement. Send detailed resume of experience and education to
Director of Personnel
West Virginia Pulp & Paper Company
Luke, Maryland

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Construction Executive, available as project manager, on large operation, chief estimator for large organization or in other executive position where scope warrants employment of top man, thoroughly experienced on all types of construction and in every phase of general contracting. PW-6635, Engineering News-Record.

Graduate Civil Engineer, 32, married. Employed 6 years by consulting engineer on construction of three turnpikes. Directed asphalt, concrete and soils staffs. Desire to join contractors estimating department. PW-6658, Engineering News-Record.

Experienced Estimator & Construction Engineer, graduate civil engineer, age 45, 20 years experience in architectural, engineering and construction activities. Capable of preparing estimates, pricing purchasing, expediting and job management. Experienced in every phase of contracting. PW-6653, Engineering News-Record.

Chief Engineer-Manager, 33, 14 years experience in sewage treatment, housing development, construction, power plant, paving, etc. Now have complete charge of progressive office. Present salary $8000. PW-6652, Engineering News-Record.

Civil Engineer—26—single. Four years experience in the field on bridges and highways. Desires to go overseas. PW-6636, Engineering News-Record.

Energetic young resident engineer available, versatile, graduate, 13 years varied experience, surveys, location, supervision large industrial and military projects. Will relocate Canada, U. S. or foreign. Position must involve wide responsibilities. PW-6630, Engineering News-Record.

Sales Engineer—now employed selling consulting engineering design service, covering East and Midwest, desires connection with more progressive firm. PW-6620, Engineering News-Record.

Material Man—purchasing, expediting, receiving, storing. Tool rooms, warehouses. Age 58. 35 yrs. construction experience. PW-6621, Engineering News-Record.

SELLING OPPORTUNITY WANTED

Manufacturers Agent seeks additional lines. Straight commission or jobbing basis. Excellent connections architects, contractors, eastern New York State. RA-6647, Engineering News-Record.

BUSINESS OPPORTUNITIES

Wanted to Buy stone and aspalt paving business. Prefer plant operations. BO-6583, Engineering News-Record.

Capital to invest. Young contractor will invest up to $100,000 cash and equipment valued at $150,000. Equipment consists mostly of late D4 and D7 Caterpillar tractors and trucks, etc. Contractor's pervious experience is land clearing and road building for public utlities, but will consider investment or merger with any individual or company on equitable basis doing any type of contracting work anywhere. Write details to P. O. Box 1017 Danbury, Conn.

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CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

BUSINESS OPPORTUNITIES

(Continued from opposite page)

Small contractor, Rocky Mtn. area, wants engineer experienced in estimates and supervision of construction. Utilities preferred. Small investment required to assure permanency. Right man has opportunity for 50-50 partnership. BO-6639, Engineering News-Record.

CONSTRUCTION BOOKLET

For planning and construction estimates by engineers and contractors. Copyrighted booklet of basic formula and sample charts for rapid and accurate estimating of grading quantities for highways, railroads, canals, dams, etc. Based on many years of actual experience. $3.00 per copy, postpaid. Send orders to D. Misz, 140 E. 63rd St., N.Y.C. 21.

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Norristown, Pa. *Phone: 8-6900*

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Rentals on Barges, Tugs & Scows
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Phone 7131

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WANTED

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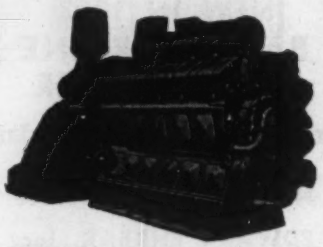

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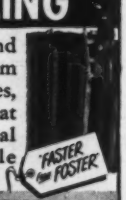

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ADVERTISERS IN THIS ISSUE

Acker Drill Co. 130
Aerojet General Corp. 146
Airtherm Mfg. Co. 143
Allis-Chalmers Mfg. Co. (Tractors) 72
Allison Engine Div., G.M.C. 165
Amer. Bitumuls & Asphalt Co. 123
Amer. Manganese Steel Div., Amer. Brake Shoe Co. 114
Amer. Mutual Liability Ins. Co. 79
Amer. Vitrified Prod Co. 5
Atlas Powder Co. 119

Barber-Greene Co. 20
Barco Mfg. Co. 60
Bay City Shovels, Inc. 120
Belcher & Assoc. Inc., D. J. 83
Belmont Iron Works. 102
Bethlehem Steel Co. 45, 131
Bros Boiler & Mfg. Co. 101
Brunner & Lay Inc. 98
Brush Aboe Inc. 18
Buchanan Lumber Co. 146
Bucyrus-Erie Co. 159
Bullard Co., E. D. 48
Butler Bin Co. 58
Byers Co., A. M. ..... 2nd Cover

Calumet Coach Co. 108
Carter's Ink Co. 139
Cast Iron Pipe Research Assoc., Inc. 14, 15
Caterpillar Tractor Co. 42, 43
Ceco Steel Prod. Corp. 112, 113
Cement Gun Co. 104
Chiksan Co. 68
Cities Service Oil. 153
Cleveland Trencher Co. 99
Commercial Shearing & Stamping Co. 150
Concrete Grinding Corp. 106
Concrete Reinforcing Steel Institute. 88
Concrete Surfacing Machinery Co. 76
Construction Machinery Co. 134
Continental Motors Corp. 32
Cotta Transmission Co. 102
Crucible Steel Co. of Amer. 127

Dorr Oliver Inc. 82
Dresser Mfg. Div., Dresser Ind. 128
Dudgeon, Inc., Richard. 144

Economy Forms Corp. 146

Fischer & Porter Co. 90, 91
Flexible Road Joint Mach. Co. 70, 71
Foote Const. Equip. Div., Blaw-Knox Co. 109
Fort Pitt Bridge Works. 11
Foster Co., L. B. 117

Gar Wood Ind., Inc. 124, 125
Gardner-Denver Co. 6, 7
Goodyear Tire & Rubber Co. 1
Greer & McClelland Co. 88
Griffin Wellpoint Corp. 154
Gulf Oil Corp. 96, 97
Gunite Concrete & Const. Co. 106

Harnischfeger Corp. 12
Hartford Fire Ins. Co. 133
Hartford Accident & Indemnity Co. 133
Hendrix Mfg. Co. 147

Ingalls Iron Works Co. 144
International Harvester Co. 148, 149
International Steel Co. 81
Irving Subway Grating Co. 64

Jaeger Machine Co. 53
Jenkins Bros. 16
Johns Manville Corp. 107

Keasbey & Mattison Co. 110
Koehring Co., The 84, 85

Lefax Co. 136
Lehigh Portland Cement Co. 55
Lenker Mfg. Co. 62
LeRoi Co. 162
LeTourneau-Westinghouse Co. 61, 63, 65
Lewis Asphalt Engr. Corp. 126
Longyear Co. 29
Louisville Cement Co. 93
Lufkin Rule Co. 130

Manitowoc Engr. Works. 166
MacWhyte Co. 86
Madesco Tackle Block Co. 100
Mahon Co., R. C. 4
Master Builders Co. ..... 3rd Cover
McConnaughay, K. E. 66
McKiernan-Terry Corp. 10
Midland Prod. 139
Mikron Inst. Inc. 106
Mississippi Glass Co. 136
Moretrench Corp. 75

National Gypsum Co. 132
Northwest Engineering Co. 3

R. W. Onan & Sons Inc. 92
Orton Crane & Shovel Co. 129

Page Engr. Co. 98
Patent Scaffolding Co. 47
Peerless Pump Div. of Food Machy. Corp. 67
Pennsylvania Drilling Co. 126
Phoenix Bridge Co. 136
Pittsburgh Corning Corp. 138
Pittsburgh-Des Moines Steel Co. 8
Portland Cement Assn. 135
Price Bros. Co. 31

Raymond Concrete Pile Co. 95
Rockford Clutch Div., Borg-Warner. 108
Roebling's Sons Corp., John A. 57
Ryerson & Sons, Inc., Jos. T. 100

St. Paul & Tacoma Lumber Co. 9
Servicised Prod. Corp. 30
Sherman Prod., Inc. 121
Sika Chemical Corp. 104
Smith Co., S. Morgan. 77
Soilaire Ind. 76
Spencer, White & Prentis, Inc. 80
Sprague & Henwood, Inc. 144
Standard Dry Wall Prod. 28
Standard Steel Corp. 78
Stang Corp., John W. 105
Symons Clamp & Mfg. Co. 2

Tapecoat Co. 74
Templeton Kenly Co. 102
Texas Co. ..... 4th Cover
Thew Shovel Co., The 141
Timken Roller Bearing Co. 89
Tinney Drilling Co. 108
Truck Mixer Mfr. Bureau. 145
Tube Turns, Inc. (Insert) 49, 50

Union Oil Co. 13
U. S. Pipe & Foundry Co. 161
U. S. Rubber Co. 34, 35
U. S. Steel Corp. 142
United Steel Fabricators, Inc. 94
Universal Mfg. Co. 33
Universal Form Clamp Co. 137

Viber Co. 111
Vickers, Inc. 155

Water Works Supply Co. 126

Youngstown Sheet & Tube Co. 103

Zonolite Co. 69

Professional Services 178

SEARCHLIGHT SECTION
(Classified Advertising)
T. J. Eberle, Ass't. Mgr.

Employment 153-155
Educational 174
Notices
Proposals 167-170
Equipment
(For Rent, Sales, Wanted) .. 175-178

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Number of copies of this issue printed 67,714

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EDITORIALS

States Should Control Pollution

THE WATER POLLUTION CONTROL ACT of 1948 gave the federal government the authority to enforce abatement of pollution beyond borders of the state of its origin—but only with consent of the state involved. This federal control, with state prerogatives protected, was a carefully worked out compromise. Now, in a bill needed to extend the expiring act of 1948, there are changes inserted eliminating the requirement of state consent before federal court suit.

Strong opposition to such change in the law has been roused (ENR Mar. 17, p. 21). It should not be permitted to slacken until a bill acceptable to state and interstate water-pollution agencies has been accepted by both houses of Congress. For, even granting that an ultimate control vested in the U. S. Public Health Service is desirable, responsibility for pollution control in its day-to-day execution and enforcement rests rightfully in the hands of the states and their agencies of cooperative effort.

States rights are at issue here, but by no means should a hassle over sovereignty blur other points in favor of the law remaining as it is. Rights imply duties. If it is the states' right to handle the nation's stream pollution problem, then it is their duty, their responsibility, to enforce pollution control. There is evidence that they are discharging that duty in the fact that only once since 1948 has it been necessary to begin federal enforcement procedures. If there had been many such cases, if there were ample evidence that the states were not discharging responsibilities inherent in their right to control pollution of the nation's streams, then perhaps this right ought to be taken from the states and vested in a higher authority, the federal government. But such is not the case.

A second point needs consideration. Just as with most diseases, there are two means of pollution control: prevention and cure. Cure, or correction, is the control method at issue when it comes to the court actions involved here; and such correction can be handled at state level. Prevention, on the other hand, remains a problem of research into treatment methods yet unknown insofar as many pollutants in our streams are concerned. Such research, while beyond the pocketbooks and facilities of most states, is a natural concern of the federal government under the pollution control law. It is for just such research that the Robert A. Taft Sanitary Engineering Center has been built (under the existing law) in Cincinnati.

Over-emphasis on policing of water pollution by the Public Health Service, could sap (and possibly already has sapped) energy from the vital work of research from which prevention of pollution should come. Passage of a bill now that would add federal emphasis on the negative approach to abatement might further forestall really significant positive steps toward pollution control.

The states are effectively exercising their responsibility for water pollution control; the Public Health Service could better exert its energies toward the positive side of pollution prevention. For these two reasons, increased federal authority in the bill now before Congress is undesirable.

Wires Need Corrosion Protection

CAUSE OF THE FAILURE of prestressing wires in the concrete wall of the 12-mg Richmond reservoir of the East Bay Municipal Utility District (Calif.) is not yet known with certainty. But the facts indicate that some form of corrosion most probably was responsible.

Some of the investigators strongly suspect stress corrosion—a combination of high static stress and corrosion that causes metal to crack—and there appears to be much evidence to support this conclusion. However, other possibilities have not been completely ruled out.

The wires for applying circumferential prestress in the wall of the 200-ft dia tank were lightly corroded when placed in the tubes used to prevent bond with the concrete. The resulting rough surface, among other factors, increased the stress losses due to friction when the tendons were tensioned. So the cables were left ungrouted to permit re-tensioning later. After five months, when the cables were re-tensioned, some of the wires were found corroded and broken, and the cables were replaced (ENR June 2, p. 27). Broken ends of the wires showed signs of a brittle-type failure, according to reports.

From these facts, it is easy to build up a case proving that stress corrosion cracking could have caused these failures. High tensile stresses were present, and the failures occurred a considerable time after the wires were tensioned. The theory is that high local stresses accelerate the formation of galvanic cells, and cracks grow by dissolution of newly formed anodic material ("Corrosion Handbook", H. H. Uhlig, John Wiley & Sons, Inc.). An investigator is reported to have discovered such cracks in the broken wires.

While admitting that stress corrosion is a possible cause, other investigators claim that other possibilities cannot be completely ruled out. For example, they cite chemical corrosion, due to deleterious elements in the atmosphere, and wire unduly sensitive to corrosion.

In any event, these wire failures point up once again the necessity of protecting steel against corrosion. They raise the question as to whether wire or bars that may not be encased immediately in concrete should be galvanized or painted. And certainly, they emphasize the advisability of promptly grouting tendons in place.

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Something new in military airports

U. S. Army photograph

This strange looking airport, recently constructed at Fort Eustis, Va. for the Army Transportation Corps, is believed to be the world's first military air field designed exclusively for helicopters. Its distinctive features include a circular taxiway, inside which two 600-foot runways bisect one another, while eight landing pads for 'copters project from the taxiway's outer edge.

In paving this heliport's runways and taxiways, as well as the 100′ x 750′ parking area in front of the buildings, the same, resilient, flexible type of construction was used throughout. A 7-inch waterbound macadam base was topped by a 3-inch layer of broken stone, penetrated by a hot application of Texaco Asphalt Cement. A durable, shock-absorbing wearing surface of plant-mixed Texaco Asphaltic Concrete completed the pavement.

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